Health Systems and Maternal Mortality, Neonatal Mortality and Child Health

Review of Selected Service Delivery Models

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Health Systems and Maternal Mortality, Neonatal Mortality and Child Health: Review of Selected Service Delivery Models

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CONTENTS

ABBREVIATIONS

AIDS	Acquired immuno-deficiency syndrome
ANC	Antenatal care
ARI	Acute respiratory infection
CHPS	Community-based Health Planning and Services
CHO	Community health officer
CHV	Community health volunteer
DHMT	District health management team
EmOC	Emergency obstetric care
EPI	Expanded program on immunization
FWV	Family welfare visitor
HFWC	Health and Family Welfare Center
HIV	Human immuno-deficiency virus
IMCI	Integrated management of childhood illnesses
LHW	Lady health worker
MCH-FP	Maternal and child health and family planning
MCWC	Maternal and Child Welfare Center
MDG	Millennium Development Goal
NGO	Non-government organization
PHC	Primary heath care
PNC	Postnatal care
RACHA	Reproductive and Child Health Alliance
STD	Sexually transmitted disease
TBA	Traditional birth attendant
TEHIP	Tanzania Essential Health Interventions Project
THC	Thana Health Complex
TT	Tetanus toxoid

EXECUTIVE SUMMARY

Effective maternal and child health services at the community level in developing countries are hardly available. In many developing countries the health systems cannot provide quality maternal and child health care services due to lack of adequate and appropriately trained human resources, chronic shortages of equipment, drugs and basic supplies, and the absence of proper referral mechanisms. Strengthening health systems is central to improving maternal and child health. A variety of targeted interventions, i.e. service delivery models, have been implemented in the health systems in developing countries. This study was conducted to identify the health service delivery models, which have contributed to the reduction of maternal, infant and child mortality in five selected developing countries, and also to identify the strengths and limitations of these models. The countries studied are Bangladesh, Cambodia, Pakistan, Ghana, and Tanzania. These countries were selected according to the level of maternal and infant mortality, the initiatives undertaken in the health sector to improve the maternal and child health, and the level of progresses towards achieving the health related Millennium Development Goals. Based on a set of selection criteria, several successful service delivery models implemented in the selected countries have been identified.

The community health volunteer model in Bangladesh demonstrates that appropriately selected and trained community members can deliver basic health services including maternal and child health services at the doorstep. Similarly, the strategy to recruit and train female workers to bridge the gap between service delivery from health facilities and the community worked in Pakistan. Findings suggest that lady health workers form an invaluable body of skilled human resources to provide doorstep family planning and primary health care services including maternal and child health services and to identify and refer serious illnesses in underserved areas in Pakistan. It has emerged from Cambodia's Reproductive and Child Health Alliance program that establishing successful partnership with the Ministry of Health at multiple levels and using existing resources, whether private or public in nature, both professional and traditional workers increased the availability of maternal and child health services in rural areas. In Ghana, the Community-based Health Planning and Services initiative characterizes the key strategy for changing primary health care and family planning from a focus on clinical care at district and sub-district levels to a new focus on convenient and quality services at the community level. Tanzania's experience substantiates the need for developing and delivering locally prioritized cost-effective health services. It is observed that the Tanzania Essential Health Interventions Project has improved the functioning of Tanzania's health system by using the planning tools and the additional fund.

Experiences from the Maternal and Child Welfare Center strengthening project in Bangladesh indicate that training of the service providers and upgrading facilities are required to provide safe motherhood services including comprehensive emergency obstetric care effectively in rural areas. In Cambodia, the Kean Svay Child Survival Project strengthened community capacity to identify and respond to health needs, strengthened local health care service delivery, trained staff and established functional community-based structures to support local health systems in delivering quality services.

In Tanzania, the Skilled Care Initiative built the capacity of service providers and local level health facilities to provide skilled care for both routine maternity care and obstetric emergency care at the community.

Implementation experiences reveal that the Community Health Volunteer program and the Maternal and Child Welfare Center strengthening project in Bangladesh, Pakistan's Lady Health Workers program, Reproductive and Child Health Alliance program in Cambodia, Community-based Health Planning and Services program in Ghana, and Tanzania Essential Health Interventions Project can be characterized as successful service delivery models. The major strength of these service delivery models is their community-based health care approach. Implementation of these models demonstrates some significant achievements fundamental to reducing maternal and child mortality and morbidity. They are: capacity building which includes training of service providers and recruiting and training community health workers/volunteers; strengthening service delivery systems, including upgrading facilities, developing local level evidence-based planning, and strengthening linkages for referral; involving the community in developing and implementing health services; and public-private partnership.

It can be concluded that strengthening health service delivery systems with skilled and motivated health workers is the essential and integral part of community-based health care services. Community-based initiatives can extend the targeted maternal and child health services in areas where health services are hard to access. When the successful experimental service delivery models are to be implemented at the national level, the cost of expansion, the capacity to replicate, the technical support required to implement the strategies, and the coordination among various stakeholders should be considered in detail.

I. INTRODUCTION

Generally, a health system is a combination of the facility-based service delivery, activities in the household and community and the outreach that supports it, and broader public health interventions. The World Health Organization defines health system as "all the activities whose primary purpose is to promote, restore, or maintain health" (WHO 2000). The principal objective of a health system is to improve people's health, and the activities of the system are designed to deliver health services. The performance of health care systems depends on the knowledge, skills, motivation and distribution of the people responsible for organizing and delivering services. It includes all categories of providers – public and private, formal and informal, for-profit and not-for-profit, allopathic, and indigenous. The availability, quality, efficacy, safety and rational use of drugs and health technology are necessary for effective health service delivery. In addition, financial resources, efficient management, and functional networks of communication and transportation are necessary to ensure improved health service delivery.

In many developing countries, the needed health systems either do not exist or need significant strengthening. Hence, health systems cannot provide efficient and quality services due to lack of adequate and appropriately trained human resources and chronic shortages of equipment, drugs and basic supplies. The absence of proper referral mechanisms from community to health facilities is also a major barrier to life saving advanced care. In the coming years, institutions and agencies concerned with improving the currently grim health outlook in Asia and Africa must take a more systemic approach – focusing some of their attention to apparently mundane matters within the health system, such as infrastructure and health human resources (Savigny et al. 2004).

Health outcomes are unacceptably low across much of the developing world. The failure of health systems is considered responsible for low maternal and child health outcomes. Pregnancy and childbirth remain a catastrophic experience for many women in developing countries, killing half a million women annually. Another 20 million women live but experience lasting morbidities or complications experienced during childbirth (UNFPA 2003). Less than half of the women in developing countries get adequate health care during and soon after childbirth and more than three-quarters of all maternal deaths also occur during this time (AbouZahr 1997). This situation is even worse for poor, illiterate, and rural inhabitants. Maternal deaths are more common among sexually active adolescents than among women in their mid 20's and early 30's. Physiologically and socially, adolescents are more vulnerable to maternal death, and children born to them are more likely to die during their first five years of life than those born to women aged 20-29. Each year, about 19 million women experience an unsafe abortion worldwide, of which 18.5 million unsafe abortions take place in developing countries. Approximately one in ten pregnancies ends in an unsafe abortion worldwide, and one unsafe abortion takes place for every seven births (WHO 2004). These unsafe abortions are primarily conducted by unskilled professionals due in large part to legal restrictions in the countries. This often results in disabilities and even deaths.

Generally, most maternal deaths and disabilities occur due to one or more of three delays: delay in recognizing complications, delay in reaching a medical facility, and delay in receiving good quality care. Maternal deaths can be prevented through the following ways:

Skilled attendant at birth: The single most important way to reduce maternal deaths is to ensure the assistance of a skilled health professional at every birth. A skilled birth attendant quickly recognizes and manages complications and refers the pregnant woman to appropriate facility. Most importantly, they are able to assist deliveries. While, skilled attendance is nearly universal in developed countries, there is a serious shortage of these professionals in the developing world. Whether by choice or out of necessity, most women in the developing world give birth each year without skilled care.

Routine maternal care during pregnancy and after birth: Complications of pregnancy and childbirth are the leading causes of disability and death among women of reproductive age in developing countries. It is observed that 70 percent of these women do not receive any antenatal care (ANC) (WHO, UNICEF, and UNFPA 2004). The proportion of women who get care during delivery is lower than those who receive ANC. The situation is more serious in the case of postnatal care (PNC). The majority of women in developing countries do not receive PNC. Only 30 percent of women in developing countries receive PNC to detect any problems, support breastfeeding, and receive family planning information or services (Global Health Council 2007). To ensure safe delivery and to reduce post delivery maternal deaths requires good quality of both ANC and PNC services.

Emergency treatment of complications during delivery: It is estimated that about 15 percent of all pregnancies result in complications (UNFPA 2003). Untreated, many of these complications will be fatal. While the general health status of pregnant women is important for a positive outcome of delivery, deadly complications randomly occur in all women. Emergency obstetric care (EmOC) is a response to complications and is not standard practice for all deliveries. The emergency obstetric care functions are often divided into two categories: basic EmOC, which can be provided at a health center by a nurse, midwife or doctor, and comprehensive EmOC, which usually requires the facilities of a hospital with an operating theater. In developed countries, maternal death has become a rare event due to access to high quality health care. Less than one percent of maternal deaths occur in developed countries (WHO, UNICEF, and UNFPA 2004), demonstrating that maternal deaths could be avoided if resources and services are made available.

Safe abortion: Unsafe abortion remains a significant cause of maternal morbidity and mortality in much of the developing world. Globally, an estimated 68,000 women die as a consequence of unsafe abortion, causing the deaths of about 185 women each day (WHO 2004). All these deaths occur in developing countries. A large number of maternal deaths could be avoided if safe abortion services were provided by trained staff. High quality services for treating and managing abortion-related complications need to be ensured through the health system.

Healthy timing and spacing of pregnancy: Women's ability to control their fertility could, by itself, reduce the number of maternal deaths by as much as 20–35 percent simply by reducing pregnancies to the number desired (Freedman et al. 2005). Moreover, birth spacing has a substantial effect on child mortality, potentially reducing child deaths by as much as 20 percent in some cases (Jones et al. 2003). The World Health Organization recommends that women should wait for at least 2–3 years between births in order to reduce the risk of adverse maternal and child health outcomes. After a miscarriage or induced abortion, the recommended minimum interval to next pregnancy should be at least six months in order to reduce risks of adverse maternal and peri-natal outcomes.

In addition to maternal mortality, infant and child mortality have become issues of grave concern. Every year about 10.5 million children die from preventable diseases (UNICEF 2005). This is mostly occurring in low-income countries or poor areas of middle-income countries. Such deaths could be easily averted as currently, effective and relatively inexpensive interventions are available for these ailments. Meanwhile, global child deaths have dropped significantly over the past 25 years. However, the rate of decline has slowed in parts of Africa and South Asia. To reduce infant and child mortality, the issues that need to be addressed through strengthened and improved service delivery of health system include the following:

Neonatal care: The World Health Organization estimates that four million neonates die each year. A very large proportion of these neonatal deaths approximately three-quarters take place in the first week of life (Lawn, Cousens, and Zupan 2005). Major causes of these deaths include women's poor health during pregnancy, inadequate care during delivery, and lack of newborn care. These factors are also responsible for maternal death and disability (WHO 1997). UN Statistics Division (2005) reported that improving the nutrition of mothers and basic health services such as ANC and availability of skilled birth attendants would reduce the infant deaths in the first week of life, more than 20 percent of under-five mortality. Almost 50 percent of neonatal deaths are caused by infection (Knippenberg et al. 2005). Many cases of neonatal infection never reach treatment facilities. Throughout the world, acute respiratory infection (ARI), primarily pneumonia and diarrhea are two major causes of neonatal deaths. To ensure neonatal care, there is a necessity to improve the skills of health workers, improve the health system including equipment and supply of drugs and vaccines, and improve household and community practices.

Nutritional status: The World Health Organization identified that globally 5.5 million child deaths were attributed to malnutrition (UNICEF 2005). In developing countries, malnutrition is a major factor contributing to child mortality. It is estimated that of the nearly 16 percent of all babies born worldwide with low birth weight, about one-third of them are born in the South Asian nations of India, Pakistan and Bangladesh (UNICEF 2005). These babies die more often than babies of normal weight, and are at greater risk for infection, and long-term disabilities. To improve nutritional status of both mothers and children requires improving the health service delivery at the community level to provide preventive services.

Prevention and treatment of diseases: The severity of many childhood illnesses can be reduced, or eliminated altogether, through prevention and treatment. Sixty percent of the 10 million deaths in 2000 – that is, 6 million child deaths – could have been prevented in the 43 countries accounting for 90 percent of child mortality (UN Statistics Division 2005). For example, comprehensive immunization against measles could have saved the lives of 2.3 million African children in the last decade (Global Alliance for Vaccines and Immunization 2003). In the developing world, infectious and parasitic diseases remain a major cause of death. Although notable success has been achieved in certain areas (for example, polio), pneumonia, diarrhea, malaria and measles still account for majority of all child deaths in developing countries (UN Statistics Division 2005). It is well known that these diseases are completely preventable and curable through vaccines and treatment.

Rationale

Substantial progress has been made over the last few decades in reducing maternal and child mortality. The growing interest in the health sector by both international organizations and national governments, and the impetus given by the Millennium Development Goals (MDGs) have led to a remarkable increase in maternal and child health programs. Some of these programs have led to considerable innovation and experimentation in strategies to increase access to maternal and child health services. However, progress in reducing maternal and child mortality seems to have slowed in many developing countries. At the current rate of progress, only a few countries are likely to achieve the MDGs of reducing maternal and child mortality to one-third of their 1990 levels. Therefore, effective interventions or service delivery models need to be developed and scaled up to achieve considerable gains in combating maternal death, illness and child mortality in the next decade.

Much of maternal, infant and child mortality can be prevented with known, affordable technologies. In this connection, safe motherhood programs, family planning, addressing malnutrition and micronutrient deficiencies and promoting universal immunization coverage remain the most significant challenges in achieving the health-related MDGs. In addition to vertical-targeted interventions, there is room for general improvements. The problem is the availability of trained staff, drugs, vaccines and information – on time, reliably and in sufficient and affordable quantities – to those who need them.

Effective health service delivery is required to improve maternal and child health. A range of health system activities or factors contribute to effective service delivery, which includes human resources for health, service delivery facilities including health center/clinic, equipment and supplies, provision of targeted health care/service, community health services, referral system, involvement of multiple actors (e.g. government, non-government and private sector, and community), and necessary support systems. Comprehensive attention is needed for a deeper understanding of the systemic or structural factors that contribute to the reduction of maternal and child mortality and morbidity. Until now, little interest has been shown to analyzing the role of the health system in general, and specific program components or strategies in particular in

reducing maternal and child morbidity and mortality. As different countries have different strategies for maternal and child health improvement with mixed results, both successes and failures, there are important lessons to be learned from comparing health systems, identifying the interventions used, and evaluating the effects of various service delivery improvement initiatives. However, documentation of the implementation experiences of service delivery models adopted in the health systems, particularly in a compiled form, is not readily available. It is in this context, the report investigates the health service delivery models of the selected countries, which have been implemented with the aim to reduce maternal, neonatal and child mortality and have also succeeded in reducing maternal and child mortality.

It is expected that the findings presented in this report will provide the health policy makers, planners and funding agencies concrete evidence on systemic or structural factors that affect maternal and child health in different settings.

Objectives

The aim of this study is to assist policy planners and program managers of the developing countries, particularly those in Africa and Asia to identify successful service delivery models in the health system that have contributed to the reduction of maternal, infant and child mortality with a view to improve the services by strengthening their national health system. The specific objectives are to:

- Provide an overview of the health systems in selected countries with particular focus on maternal and child health
- Identify the health service delivery models, which have contributed to reducing the maternal, infant and child mortality in these selected countries, and
- Identify the strengths and limitations of these selected service delivery models.

Methodology

This study was conducted to identify successful service delivery models in the area of maternal and child health which were implemented in the recent past in five selected countries. The countries studied here are Bangladesh, Cambodia, Pakistan, Ghana, and Tanzania. The selection of the countries was based on the level of maternal and infant mortality, the initiatives undertaken in the health sector to improve maternal and child health, and the level of progresses towards achieving the health-related MDGs.

To identify successful service delivery models, relevant literatures describing the role of health service delivery models or programs in improving maternal and child health in the selected countries were carefully reviewed. The process of identifying the service delivery models or programs or projects (hereafter referred as "models") included expert opinion as well. In this connection, a consultative meeting was organized in Dhaka. Based on valuable inputs of the participants, a list of criteria to select successful service

delivery models was prepared. The outline of the review paper was also finalized in the meeting. The criteria used to select the models are shown in Box 1.

Several successful service delivery models implemented in the selected countries were identified on the basis of the selection criteria. None of these models fulfilled all the selection criteria. However, those, which met most of the criteria, were selected for review. Also, several models that have demonstrated the potential to be replicated though yet to be evaluated were selected for review in some countries. Individual resource persons were identified, contacted and requested to prepare the country papers. The authors were requested to follow the selection criteria and guideline, so that the same contents were covered. They utilized secondary sources of information to prepare the country papers. Each of the country papers described the implementation experiences of and evaluations on the selected health service delivery models.

Box 1 Criteria for selecting successful service delivery models

- Coverage – Substantial number of populations (e.g. at least 500,000 people) received the services provided by the model
- Documentation – Reasonable process documentation and evaluation
- Duration – At least five years
- Efficiency and effectiveness – Whether the model increased the utilization of services (or proved useful to improve the indicators) and proved rational with the resources utilized
- Sustainability – The potential to continue if the supports provided during the piloting are withdrawn
- Replicability – Whether the model can be implemented on a wider scale or replicated in other places
- Community involvement – Participation of community members in prioritizing, designing, delivering and managing activities
- Public private partnership – Participation of public sector, private sector and NGOs in delivering and managing the services

The report primarily reviewed the country papers on Bangladesh, Cambodia, Pakistan, Ghana, and Tanzania, prepared by the resource persons. These country papers were carefully examined to assess the success, strengths and challenges of the selected service delivery models. In addition, relevant materials on the health system and health policies with particular reference to maternal and child health of the selected countries were reviewed.

Organization of the report

The report is divided into five sections. The rationale, objectives and methodology of the study are delineated in the Section I. Section II provides a comparison of health care service delivery structures of the selected countries. Maternal and child health situation is also highlighted in this section. Section III discusses the experiences of selected service delivery models directed towards improving maternal and child health in the selected countries. Section IV summarizes the lessons learned from the selected service delivery models. The last section is the concluding part of the report, which analyzes the key study findings for future direction.

II. AN OVERVIEW OF MATERNAL AND CHILD HEALTH IN SELECTED DEVELOPING COUNTRIES

A comparative analysis of health care service delivery structure

Of the five countries under investigation, four have a well-distributed national health care service delivery structure, excluding Cambodia. Both Bangladesh and Pakistan have comprehensive physical infrastructure to deliver health service in all – primary, secondary and tertiary – levels. With a well-distributed national health care delivery system, Ghana provides basic preventive and curative services through the 'community health compound'. These outreach services bridge the access gap to health facilities. Likewise, Tanzania has a well-distributed national health care service delivery structure with a vast network of primary health care facilities. Cambodia, however, is yet to develop a well-functioning health system i.e. comprehensive physical infrastructure to deliver health services in all levels, particularly in rural areas. Bangladesh and Pakistan have better records with regard to the distribution of qualified health personnel. Per capita government health expenditure for these five countries ranges between US$ 4.00 to 7.00, with the lowest reported in Bangladesh and Pakistan and the highest in Tanzania. The total per capita health expenditure for these countries is estimated at US$ 12.00 to 16.00 with the exception of Cambodia where the reported total health expenditure is US$ 33.00 (WHO 2006). The following table describes the health care service delivery structure of the selected countries.

Table 1 Overview of Health Care Service Delivery Structure of Selected Countries

Bangladesh	
Administrative structure	Bangladesh is divided into six administrative divisions, 64 districts and 496 sub-districts or *upazilas*.
Health service structure	**Primary level** ▪ Doorstep maternal and child health and family planning (MCH-FP) and preventive health services ▪ Satellite clinics provide MCH-FP services ▪ Health and Family Welfare Centers (HFWCs) each covering 30,000 population ▪ Thana Health Complexes (THCs) with 31-51 beds each at the sub-district level and covering 250,000-300,000 population ▪ Non-government organization (NGO) clinics in urban poor and rural areas **Secondary level** ▪ District hospitals, with 50-200 beds each and covering 1-2 million population, serve as referral for THCs ▪ Maternal and Child Welfare Centers **Tertiary level** ▪ Government medical college hospitals established in urban areas - referral institutions ▪ Postgraduate institutes and hospitals ▪ Specialized institutes located in the capital city

Human resources*	One doctor for 3,088 persons One nurse for 6,625 persons One hospital bed for 2,506 persons
Cambodia	
Administrative structure	Cambodia is divided administratively into 24 provinces, 76 operational districts, and 1,100 communes.
Health service structure	**Primary level** ▪ 'Health center' covering a population of 10,000 **Secondary level** ▪ Operational district hospital - first referral hospital covering a population of 100,000-200,000 **Tertiary level** ▪ National referral hospitals at the capital city
Human resources**	One doctor for 6,250 persons One nurse for 1,639 persons One hospital bed for 1,667 persons
Pakistan	
Administrative structure	Pakistan is divided into four provinces and three federally administered areas, 120 districts and 380 *tehsils/talukas.*
Health service structure	**Primary level** ▪ Doorstep MCH-FP and preventive health services ▪ Dispensaries ▪ Basic Health Units covering a population of 10,000-15,000 ▪ Rural Health Centers with 20-25 beds each and covering 50,000-100,000 population **Secondary level** ▪ Tehsil/Taluka Headquarter Hospitals with 60 beds ▪ District Headquarter Hospitals **Tertiary level** ▪ Large urban hospitals attached to medical colleges ▪ Postgraduate institutes and hospitals
Human resources**	One doctor for 1,351 persons One nurse for 2,174 persons One hospital bed for 1,429 persons
Ghana	
Administrative structure	Ghana is divided into 10 administrative regions, 110 districts.
Health service structure	**Primary level** ▪ Community Health Compound, covering 5-10 villages

	Secondary level ▪ The 'health center' at sub-district level covering population of 20,000 ▪ The polyclinic - the urban version of the rural 'health center' - offers a more comprehensive array of services including complicated surgical services ▪ District hospitals with 50 to 60 beds, each serve an average population of 100,000 to 200,000 people. It is the first referral hospital **Tertiary level** ▪ Regional hospitals having 150 to 200 beds each provide services to a population of about 1.2 million ▪ Teaching hospitals provide complex curative care and receive referrals from districts as well as the regions
Human resources***	One doctor for 17,733 persons One nurse for 1,510 persons One hospital bed for 1,048 persons
Tanzania	
Administrative structure	Tanzania is divided into 26 regions for administrative purposes, and 129 districts.
Health service structure	**Primary level** ▪ Outreach MCH-FP services ▪ 'Village health post' provides preventive health services ▪ Dispensary service covers 6,000-10,000 people, and supervises village health posts **Secondary level** ▪ 'Health center' serves around 50,000 people ▪ District hospital **Tertiary level** ▪ Regional hospitals ▪ Referral or consultant hospitals
Human resources****	One doctor for 18,637 persons One nurse for 5,397 persons One hospital bed for 981 persons

Sources: *Directorate General of Health Services, Bangladesh 2006
**World Health Report 2006
***Ministry of Health, Ghana 2005
****Tanzania Joint Health Review 2003

Maternal and child health situation

High rates of maternal mortality and morbidity continue to be important challenges for health systems in the five countries. Of them, Tanzania's maternal mortality rate remains at an unacceptably high level and the lowest rate is observed in Bangladesh. Current levels of both infant and under-five mortality in the selected countries are unacceptably high. Among them, the lowest under-five mortality was reported in Cambodia.

Utilization of professional maternal health care during pregnancy and childbirth is low in Bangladesh, Pakistan and Cambodia. Use of antenatal care is not common in these countries. On the other hand, utilization of antenatal care is almost universal in Ghana and Tanzania. It is also observed that the proportion of births attended by skilled professional is alarmingly low in Bangladesh, followed by Pakistan and Cambodia. Nearly half of the mothers in Ghana and Tanzania have assistance of medically trained birth attendants during delivery. Despite an impressive health infrastructure, home birth is almost universal in Bangladesh. In Cambodia and Pakistan, three-quarters of pregnant women still deliver at home. The use of health facilities for delivery of births is relatively higher in Tanzania and Ghana, yet it is still low because more than half of the births are delivered at home (Table 2).

Use of professional maternity care after delivery is low in all countries. Postnatal care is an area where Bangladesh, Cambodia and Tanzania struggle. Utilization of postnatal care is relatively better in Ghana. Interestingly, tetanus toxoid (TT) vaccination among women is more or less satisfactory in all five countries except Pakistan. A similar trend is observed in the case of childhood vaccination. More than two-thirds children of aged 12-23 months are fully immunized in Bangladesh, Cambodia, Ghana and Tanzania, while only half of the children aged 12-23 months in Pakistan are fully immunized (Table 2).

Table 2 Maternal and Child Health Indicators in Selected Countries

Indicator	Bangladesh	Cambodia	Pakistan	Ghana	Tanzania
Maternal mortality ratio	320	437	350	540	578
Infant mortality rate	65	65	85	64	68
Under five mortality rate	88	83	110	111	112
Total fertility rate	3.0	3.4	4.8	4.4	5.7
Contraceptive prevalence rate	58	40	28	25	26
Received any ANC	56	69	45	92	94
Delivery at home	90	78	76	53	53
Skilled attendance at births	13	32	20	47	46
Received any PNC	18	15	31	47	17
Children aged 12-23 months fully immunized	73	67	50	69	71
Pregnant mothers received TT	85	77	31	83	80

Sources: Bangladesh Demographic and Health Survey 2004
Bangladesh Maternal Health Services and Maternal Mortality Survey 2001
Cambodia Demographic and Health Survey 2000, 2005
Ghana Demographic and Health Survey 2003
Maternal and Child Health in Pakistan 2004
Pakistan Reproductive Health and Family Planning Survey 2000/2001
Pakistan Statistical Pocket Book 2004
Tanzania Demographic and Health Survey 2004-05

It is important to know whether low utilization of professional maternity care during and after delivery is responsible for the high maternal deaths in developing countries. It is reported that the causes of maternal deaths are nearly alike in the selected countries. The most common obstetric causes of maternal deaths are hemorrhage, eclampsia, obstructed labor, and postpartum sepsis (NIPORT et al. 2003; Bhutta 2004; WHO 2005; NBS and ORC Macro 2005). Added to these are a substantial number of women succumbing to unsafe abortions in these countries. HIV and AIDS has also become a major cause of maternal mortality and morbidity in Tanzania (NBS and ORC Macro 2005). Therefore, maternal deaths can be attributed to one of five medical causes: obstructed labor, hemorrhage, eclampsia, infections, and the complications resulting from unsafe abortions. These medical conditions demonstrate the need for efficient emergency interventions, which can be carried out by trained health professionals. In other words, skilled attendance at births, comprehensive EmOC, appropriate and timely postnatal care, and safe abortion services are essential for reducing the risks of pregnancy and birth related complications and deaths for both mother and newborn.

Similarly, a comparison of causes of deaths among children will help to prioritize what kinds of interventions can effectively reduce child mortality. ARI has been recognized as the leading cause of mortality among children under five years followed by diarrhea in Bangladesh (NIPORT, Mitra and Associates, and ORC Macro 2005). In Cambodia, the leading causes of infant mortality are ARIs, mainly pneumonia, diarrheal diseases, and neonatal conditions, including neonatal tetanus (WHO 2005). The major causes of infant mortality in Pakistan include diarrhea, respiratory illnesses and birth related complications, while birth asphyxia, low birth weight, tetanus and other infections attribute to neonatal deaths (Bhutta 2004). In Ghana, the high childhood mortality is due to an amalgam of various factors, particularly the lack of protection from preventable diseases (ORC Macro 2005). In Tanzania, common communicable diseases such as diarrhea, pneumonia, malaria and tetanus are major killers of children under five years (NBS and ORC Macro 2005). To prevent the majority of child deaths, essential newborn care and vaccination against six serious but preventable diseases, along with early diagnosis and treatment of childhood illnesses, are required.

Malnutrition among women and children is a major health problem in all five countries. There has been no change in the nutrition status of mothers and children in Pakistan and Tanzania during the last ten years (Bhutta 2004; NBS and ORC Macro 2005). Low birth weight among children and anemia among women are common in Bangladesh, Pakistan, Ghana and Tanzania (NIPORT, Mitra and Associates, and ORC Macro 2005; Bhutta 2004; ORC Macro 2005; NBS and ORC Macro 2005). Effective nutritional interventions may include infant and child feeding practices, growth monitoring, micronutrients, and anemia prevention for mothers and children.

To facilitate understanding of the process of the selected interventions, the service delivery system in each selected country has been assessed. The following tables illustrate the strengths and limitations of the individual health systems. In addition, the policies and strategies adopted to improve maternal and child health are described in the tables.

Table 3 Strengths/Weaknesses of the Health System and Relevant Policies and Strategies, Bangladesh

Category	Description
Strengths	▪ Comprehensive physical infrastructure to deliver health service in primary, secondary and tertiary levels ▪ Universal access to primary heath care (PHC) facilities in rural areas ▪ Partnership with NGOs in urban areas for PHC and MCH services ▪ Availability of female paramedics to provide MCH-FP services including basic EmOC in rural areas ▪ Availability of female MCH-FP workers at the doorstep in rural areas ▪ Formal referral chain from community to secondary and tertiary facilities ▪ Free of cost health and family planning services ▪ Extensive private sector service delivery in urban areas
Weaknesses	▪ Imbalance in number of doctors and nurses ▪ Limited availability of comprehensive obstetric care services in rural areas ▪ Lack of trained providers for obstetric care and safe abortion services ▪ Limited availability of trained midwives or skilled birth attendants in rural areas ▪ Lack of community participation in health activities
Policies and strategies	1976 Population Policy ▪ Reducing the population growth ▪ Integration of MCH services with family planning services ▪ Doorstep MCH-FP services Five year development plans ▪ Establishing health infrastructure ▪ Developing human resources for health ▪ Institutional development both in respect of education and training ▪ Integration of health and family planning services at the grassroots level Health Population Sector Program 1998-2003 ▪ Client centered, broader range of reproductive health services targeted at large number of population groups ▪ Essential services package which included reproductive and child health care, family planning, communicable disease control, and limited curative services ▪ Training of female outreach workers to provide skilled attendance at births Health Nutrition Population Sector Program 2003-2006 ▪ Continue providing package of essential and quality health care services responsive to the needs of the people, especially those of children, women, elderly and the poor ▪ Improving MCH-FP services in local level government health centers (HFWCs) including safe delivery services ▪ Expansion of coverage of EmOC in THCs and essential newborn care 2005 Population Policy ▪ Continued emphasis on improving family planning, and maternal and child health, including reproductive health services ▪ Emphasis on nutrition and HIV and AIDS

Table 4 Strengths/Weaknesses of the Health System and Relevant Policies and Strategies, Cambodia

Category	Description
Strengths	▪ Effective maternal health services by private sector, which includes NGOs and private service providers ▪ Widespread partnership with NGOs ▪ Community participation in health activities ▪ Availability of community health workers or volunteers in rural areas ▪ Community linkages with the primary health care facilities and services
Weaknesses	▪ Yet to develop a well-functioning health system i.e. comprehensive physical infrastructure to deliver health services at all levels – primary, secondary and tertiary ▪ Lack of PHC facilities in rural areas ▪ Acute shortage of doctors and midwives in rural areas ▪ Limited availability of both basic and comprehensive EmOC services in rural areas ▪ Limited availability of skilled birth attendants ▪ Lack of trained providers for childhood illnesses
Policies and strategies	Safe Motherhood Policy and Strategy 1997 ▪ Improving maternity care services, including birth spacing, antenatal care, clean labor and delivery, essential obstetric care, treatment of complicated abortion and prevention of sexually transmitted diseases (STDs) including HIV and AIDS National Maternal and Child Health Policy ▪ Basic EmOC at the health center level ▪ Comprehensive EmOC at referral hospital level National Immunization Policy National STD/AIDS Policy ▪ Proposed to routinely test women who seek antenatal care services at public health facilities for syphilis National Health Strategic Plan 2003-2007 ▪ Improving coverage and access to health services, especially for the poor and other vulnerable groups ▪ Strengthening the quality of care, especially for obstetric and pediatric care ▪ Increasing the number of midwives through training and capacity building National Strategy for Reproductive and Sexual Health 2006-2010 Child Survival Strategy

Table 5 Strengths/Weaknesses of the Health System and Relevant Policies and Strategies, Pakistan

Category	Description
Strengths	▪ Comprehensive physical infrastructure to deliver health service in rural areas ▪ Universal access to PHC facilities ▪ Basic and comprehensive obstetric care at all levels of health system ▪ Availability of female healthcare providers at the community ▪ Free of cost services at the primary level
Weaknesses	▪ Imbalance in number of doctors and nurses ▪ Shortage of nurses, midwives, and female paramedics in rural areas ▪ Limited availability of skilled birth attendants ▪ Limited access to comprehensive obstetric care services in rural areas ▪ Absence of formal referral chain to secondary and tertiary facilities ▪ Limited partnership with NGOs
Policies and strategies	1990 Health Policy ▪ Expansion of MCH program ▪ Capacity building of professionals/ service providers for attending births and training of attendants for caring children ▪ Involvement of private practitioners in FP 1997 National Health Policy – Vision for 2010 ▪ Continued emphasis on immunization, nutrition and family planning ▪ Control of diarrhea and respiratory diseases ▪ Training of professionals/ service providers for attending births ▪ EmOC at first level care facilities ▪ Health education Social Action Program and related projects 1993-2002 ▪ Continued emphasis on immunization, nutrition and family planning ▪ Growth monitoring ▪ Enhanced package of MCH/FP, antenatal, delivery services ▪ Training of female paramedics ▪ Full reproductive health using life cycle approach advocated in line with International Conference on Population and Development Reproductive Health Package of 1999 ▪ Maternal healthcare with focus on safe motherhood and post abortion care 2001 National Health Policy ▪ Immunization with emphasis on polio and neonatal tetanus eradication and Vitamin A supplementation ▪ Continued emphasis on expansion of lady health worker program with focus on underserved areas ▪ Expansion of female paramedics program ▪ Providing EmOC in selected districts ▪ Expansion of FP services in public and private sector and multi-sector program development

Table 6 Strengths/Weaknesses of the Health System and Relevant Policies and Strategies, Ghana

Category	Description
Strengths	▪ Well-distributed national health care delivery system ▪ Outreach services to bridge the access gap to health facilities through trained nurses ▪ Functional linkage of volunteer-based services with nurse's activities and clinical services at the community level ▪ Involvement of community and village authorities in planning and delivering health services ▪ Formal referral chain from community to secondary and tertiary facilities ▪ Effective maternal health services by private maternity homes ▪ Exemption of fees for pregnant women, under-5 children, the elderly and the poor populations reaching services for contagious diseases
Weaknesses	▪ Yet to ensure availability of both basic and comprehensive EmOC in rural and remote areas ▪ Shortage of doctors ▪ Limited availability of skilled birth attendants ▪ Lack of trained providers for childhood illnesses
Policies and strategies	1994 Population Policy ▪ Primary health care program to reduce the infant, childhood and maternal morbidity and mortality rates, especially in the rural and sub-urban areas ▪ Immunization, oral rehydration therapy, birth spacing, and breastfeeding ▪ Collaboration with the private sector and NGOs ▪ Safe motherhood strategies to help reduce the incidence of high-risk births Five Year Program of Work 1997-2001 ▪ Collaboration and partnership between public and private health care providers ▪ Efficient and effective resource allocation in the health sector Second Program of Work 2002-2006 ▪ Improving geographic access to primary services and emergency services by establishing health clinic with a Community Health Officer in remote rural area ▪ Establishing 'community health planning and services' zones countrywide ▪ Improving financial access for the financially vulnerable ▪ Improving socio-cultural access for priority groups i.e., children, women, the elderly, and people with chronic diseases and disability HIV and AIDS Strategic Framework 2001-2005

Table 7 Strengths/Weaknesses of the Health System and Relevant Policies and Strategies, Tanzania

Category	Description
Strengths	▪ Well-distributed national health care service delivery structure ▪ Vast network of primary health care facilities including dispensaries and village health posts ▪ Outreach services to provide immunization, malaria control, maternal and child health and family planning services ▪ Community involvement in health planning and services ▪ Functioning referral system from dispensary to consultant hospitals ▪ Public private mix of services – NGOs and private sector working alongside the public sector
Weaknesses	▪ Limited access to both basic and comprehensive EmOC services in rural and remote areas ▪ Safe abortion services, postpartum care and postpartum family planning not adequately available in rural areas ▪ Shortage of doctors ▪ Inadequate number of skilled birth attendants in rural areas ▪ Shortages in obstetric equipment, supplies, and drugs at the community level ▪ Lack of emergency referral system at the community level
Policies and strategies	National Health Policy 1990 ▪ Reducing infant and maternal morbidity and increasing life expectancy through the provision of adequate and equitable maternal and child health services, promotion of adequate nutrition, control of communicable diseases and treatment of common conditions ▪ Training of service providers from village to national level National Population Policy 1992 ▪ Reducing the population growth rate ▪ Integration of family planning programs into maternal and child health programs ▪ Privatization of health services and allowing private sector to open clinics Reproductive and Child Health Strategies 1997 ▪ Obstetric and gynecological care, safe motherhood, STDs and HIV and AIDS, family planning, integrated management of childhood illnesses, immunization, and nutritional deficiencies ▪ Integrated service delivery National Package of Essential Health Interventions 2000 ▪ Cost-effective interventions that address the main diseases, injuries and risk factors, plus diagnostic and health care services National Policy on HIV and AIDS 2001 ▪ Providing a framework for leadership and coordination of the national multi-sectoral response to the HIV and AIDS epidemic

III. SUCCESSFUL INTERVENTIONS FOR IMPROVING MATERNAL AND CHILD HEALTH

Although most of the developing countries have a well-distributed national health care service delivery structure, effective maternal and child health services at the community level are hardly available. Health facilities in rural areas are generally ill equipped to provide skilled care. Availability of comprehensive obstetric care and safe pregnancy termination services is limited in rural areas. Sufficient skilled birth attendants are not available in rural areas. In addition, there are shortages of nurses, midwives, and female paramedics. An emergency referral system at the community level is missing in most cases. Some strategic investments to address basic problems with the health system service delivery have been made in many developing countries. To this end, a wide range of service delivery models have been implemented with the aim to reduce maternal, neonatal and child mortality in Bangladesh, Cambodia, Pakistan, Ghana, and Tanzania. This report describes the models that have demonstrated achievements or potential of being successful. The following discussions will highlight the models under investigations.

Community Health Volunteers program in Bangladesh

Bangladesh has a pluralist health system with a mix of public, private, NGO, and traditional providers who are operating with variable reach. BRAC, a leading NGO in Bangladesh, provided health services to more than 31 million people in 2003, while actively collaborating with the Government of Bangladesh in numerous national health programs. BRAC was one of the pioneer NGOs to have started training village-based community health volunteers to provide services to the people closer to their homes. It started experimenting with *Shastho Shebika* (community health volunteers or CHVs) from its early days in the 1970s. BRAC started scaling up the program from the 1990s (Khan et al. 1998).

Women from poorer households belonging to BRAC supported 'village organizations' were selected to become CHVs. The volunteers are chosen by the community to which they belong, and they receive no salary from BRAC. They are given basic training for 16 days. BRAC physicians conduct the training that takes place at the local field office. A critical element of their capacity building is the monthly refresher training on a continuous basis to update their skills. In addition, the refresher training gives the volunteers an opportunity to discuss problems that they face in the village. It facilitates the organization to keep regular and formal contacts with CHVs and their coworkers as well as allows these workers to replenish their drug and other supplies from the BRAC office. BRAC staff, which includes doctor and program organizer, directly supervises CHVs through field visits.

The community health volunteers work part-time, usually in the afternoon, and each is assigned to approximately 300 households. During monthly household visits, they provide information on preventive and promotive health, including safe delivery, family

planning, immunizations, hygiene, water and sanitation. They provide basic curative services on a few common illnesses. The community health volunteers also provide high-skilled services such as treatment for tuberculosis and pneumonia. The volunteers visit each household under their jurisdiction to identify and diagnose ARIs among children using simple signs and symptoms. They also give assistance to the government health initiatives e.g. the distribution of vitamin-A capsules. The CHVs, in addition, identify and refer targeted children and pregnant women for immunization and assist in the management of government immunization centers and satellite clinics.

BRAC's community level health services are implemented in three tiers, and community health volunteers are linked to the functioning local health system for referral when needed. Community health volunteers or *Shastho Shebikas* represent the first tier. Female community health paramedics, called *Shastho Karmis*, represent the second tier. In addition to monitoring the targeted households and providing pregnancy-related care, each paramedic supervises 10 community health volunteers. The paramedics conduct health education meetings in the community. They maintain coordination with government health and family planning workers at the community level. The third tier is a network of clinical facilities (commonly known as *Shushastho*) providing technical and clinical support to community health volunteers and paramedics through diagnostic and treatment expertise with substantial laboratory services, outpatient facilities and inpatient services. BRAC introduced several innovative ideas to sustain the CHVs' interest in health work, such as opportunities to earn an income by selling essential drugs and other health products, and access to collateral-free loans to take up other income earning activities.

Achievements

Although BRAC had been training the community health volunteers since the late 1970s, the activities did not begin to scale up until the 1990s. While the number of community health volunteers in 1990 was 1,080, it has increased to over 48,000 in recent years (Chowdhury 2006a). It is likely to grow further in coming years with the expansion of existing programs. An evaluation that compared the performance of the community health volunteers in ARI diagnosis with the diagnosis of the same cases by trained physicians found that the CHVs identified 19 percent children as having ARIs of any kind compared to 23 percent by physicians (Hadi 2003). Similarly, the involvement of community health volunteers in the tuberculosis program has increased detection and cure rates (Chowdhury 2006a).

Strengths

The community health volunteers succeeded in social mobilization and gaining acceptance of the disseminated health information because they were recruited from the community in which they served. The success of the CHVs is further due to the fact that firstly they are women, and secondly, they are a part of the community and responsible to it. They have consequently become the frontline of BRAC's health programs through the provision of treatment for basic ailments and the distribution of essential health care

commodities, contributing to the creation of a health empowered community. With them as the nucleus, BRAC is implementing various health programs. Other factors that facilitated this achievement include the commitment and innovativeness of the sponsoring organization BRAC. The community health volunteers are well trained, well supervised, provided with logistic support, and linked to a functioning local health system for referral when needed. The 'community health volunteer' strategy implemented by BRAC is considered to be a successful response to the shortage of health human resources in rural Bangladesh. These workers provide not only basic health services to communities at the doorstep but also vertical health services.

Table 8 Summary of Community Health Volunteers Program

Assessment category	Description
Strategy	Select and train community members to deliver basic health services including MCH-FP services in rural areas
Achievements	▪ Trained 48,000 females as community health volunteers to provide health services ▪ About 31 million people in rural areas received health services provided by CHVs ▪ Increased the availability of health human resources in rural Bangladesh
Strengths	▪ Being female and part of and responsible to the community ensures accessibility to community women ▪ Doorstep health education and basic health services ▪ Regular logistic support ▪ Linkages with functioning local health system for referral ▪ Innovative incentive schemes ▪ Commitment of the sponsoring organization BRAC
Challenges	▪ Develop strategies in partnership with local authorities to keep the workers motivated in their work ▪ Reduce community people's reliance on health volunteers for curative care at doorstep
Replication/scale up	Operating in 80 percent of the rural areas

Challenges or limitations

A study conducted in the late 1990s to evaluate the community health volunteers program found an annual dropout rate of 3.2 percent (Chowdhury 2006a). Analysis of the causes of dropouts suggests that community health volunteers need to be selected by adhering to defined criteria, and the program should develop strategies in partnership with local authorities to keep these workers motivated in their work. Studies have documented that

villagers are sometimes faced with a dilemma because though the community health volunteers are not 'doctors' they do deliver health services. If villagers consider them to be doctors, there may be a risk of malpractice with fatal health consequences. It may be, therefore, prudent to educate people about the role and capabilities of the community health volunteers.

Maternal and Child Welfare Center project in Bangladesh

Although Bangladesh has a fairly extensive physical infrastructure for the delivery of health and family planning services, many facilities in rural areas do not meet the needs of women with respect to EmOC. In 1993, the government, in collaboration with the United Nations Population Fund, started to strengthen its reproductive health and EmOC services, with specific attention to improving Maternal and Child Welfare Centers (MCWCs). The collaboration began with a pilot program in eleven MCWC facilities located in the Rajshahi Division (Gill and Ahmed 2004). After the successful pilot project, the program was expanded to 64 MCWCs throughout the country to provide improved EmOC services. The staff posted at each facility includes two medical officers, four female paramedics (family welfare visitors or FWVs), two nursing attendants, a pharmacist, two maintenance and support staff as well as an ambulance driver.

All existing MCWCs have been renovated and equipped with general surgical instruments, obstetric instruments, a refrigerator, an electric generator, and essential obstetric medicines to ensure smooth and continuous EmOC service (Gill and Ahmed 2004). To improve the 24 hours availability of EmOC services, residential quarters for staff have been constructed. Linkages have been developed with medical college hospitals and district hospitals for referring complicated cases. MCWCs are provided with ambulances to ensure timely referral of complicated patients. MCWCs serve as the first referral center for obstetric emergencies in rural areas.

EmOC training is conducted to train the medical officers and FWVs working at the MCWCs. Medical officers are trained on Obstetrics/Gynecology and Anesthesiology for one year, and FWVs are trained on operation theater management and nursing care for six months. The training program is organized every year as a continuous process to fill vacancies created by transfers and postings. The staff are encouraged to maintain close links with both higher and lower level health facilities. In addition, six-month midwifery training is provided to FWVs posted at the HFWCs. After completion of training, they provide basic EmOC services at HFWCs and establish linkages with MCWCs (GOB 2003). To refresh and upgrade the knowledge and skills of the service providers, a system of annual continuing medical education has been established where the staff are required to attend a five-day course at a nearby medical college (Gill and Ahmed 2004).

Achievements

A major achievement of the project is the upgrading of services at the MCWCs. These facilities were upgraded with the provision of comprehensive EmOC services. It is clear that without these strengthened centers many women would have faced death and

disabilities (Gill and Ahmed 2004). In addition, the number of deaths reported in these centers was very insignificant indicating that MCWCs are a good investment.

Utilization of EmOC services increased over the years. It has emerged from the evaluation study that 86 percent of clients reported the easy availability of EmOC service at the MCWC (ACNielsen Bangladesh 2005). The MCWCs have been performing about 50,000 safe deliveries and 6,000 cesarean sections annually (GOB 2006). The performance of the cesarean sections increased by 48 percent during 2002 and 2005 for which the MCWCs are primarily upgraded. In addition, the performance of various other services in the MCWCs improved over the period of 2002-2005. For some services such as female sterilization and Norplant, the improvement over the three-year period was over 100 percent. The number of male sterilization has almost doubled. PNC service delivery has increased steadily from 2002 to 2005 by over one-third (Chowdhury 2006b).

Strengths

The MCWC strengthening project has been considered one of the most successful initiatives of the government, and it is a commendable success with limited human resources. The commitment, motivation, knowledge and skills of the service providers have been found to be the key strength of the program. Upgraded physical infrastructure, appropriate equipment and supplies and supportive supervision have made the program a tremendous success. Attached residential accommodation for medical officers and FWVs serves as an incentive for the staff and ensures 24 hours services. Through the linkages with higher and lower level health care facilities, safe motherhood services for complicated deliveries have been made possible. These initiatives not only led to overall improvements in the health system, but also increased access to EmOC services in Bangladesh (Gill and Ahmed 2004).

Challenges and limitations

The utilization of the MCWCs increased over time but not to its maximum potential. As identified from evaluation reports, there still exist infrastructure, human resource and programmatic barriers that prevent many women from accessing services. Improvements that need to be put in place include safe blood transfusions and screening, and ultra-sonogram facilities. It appears that a shortage of human resources to run the centers is the most important challenge facing the sustainability of the MCWCs. Moreover, as the caseload of the facility increases, it becomes difficult for the staff to provide regular quality services. Lack of awareness among pregnant women and lack of counseling by service providers have contributed to the low utilization of EmOC services (GOB 2006). For example, more than one-third (36 percent) of the clients visiting MCWCs did not know that reproductive health services were available in the facility (ACNielsen Bangladesh 2005). Also, community attitude plays a role, as it takes time for people to make use of new opportunities (ACNielsen Bangladesh 2005).

The parallel service delivery systems of 'health' and 'family planning' directorates posed particular challenges for establishing an effective referral system. The government should

make a substantial attempt to improve coordination between the separate directorates to reduce systemic discontinuity in EmOC service provision as well as duplication of efforts.

Table 9 Summary of Maternal and Child Welfare Center Project

Assessment category	Description
Strategy	Upgrade facilities in rural areas to provide safe motherhood services including comprehensive EmOC
Achievements	▪ Upgraded MCWCs in all districts to provide comprehensive EmOC services ▪ Trained doctors working at MCWCs on a range of subjects including Obstetrics, Gynecology and Anesthesiology ▪ Trained service providers working at MCWCs on operation theater management and nursing care ▪ Trained service providers posted at the lowest level facility (HFWC) in rural areas on basic EmOC and referral ▪ Increased access to comprehensive EmOC services in rural areas in Bangladesh
Strengths	▪ Improved knowledge and skills of trained service providers ▪ Upgraded physical infrastructure, appropriate equipment and supplies and supportive supervision ▪ Functional linkages with higher and lower level health care facilities to provide safe motherhood services for complicated deliveries
Challenges	▪ Shortage of human resources to run the upgraded centers ▪ Need to improve coordination between the parallel service delivery systems of the government for establishing a viable referral system ▪ Lack of awareness among pregnant women and lack of counseling by service providers
Replication/scale up	Government program, implemented nationally

Reproductive and Child Health Alliance program in Cambodia

Reproductive and Child Health Alliance (RACHA) is a broad-based program of activities, which works at the community, health center and hospital levels. It has adopted innovative methods to increase the use of health services in Cambodia. RACHA activities are incorporated within the national program and works closely with the government. RACHA supported activities tried to improve the quality and availability of maternal, reproductive and child health services in three provinces, covering a combined population of more than 1.5 million. The program utilizes existing resources, whether private or public in nature, both professional and traditional workers (Sturgis 2005). Broadly, the program builds capacity of service providers, works extensively with voluntary sectors for health promotion at the community, and provides technical assistance to improve health service delivery and management.

RACHA has conducted several trainings to build the capacity of local level service providers and other government staff. RACHA pioneered a Life Saving Skills training (basic essential obstetric training) for midwives, the frontline health care providers throughout rural Cambodia, with the establishment of several training centers. RACHA adapted the antenatal care portion of the basic essential obstetric training curriculum and utilized trained midwives to train others in antenatal care (Engender Health 2004). To ensure safe and healthy mothers, the EmOC program was introduced which included skills upgrading training for doctors and midwives in referral hospitals. On post abortion care, the program helped develop a curriculum and a monitoring tool for doctors, medical assistants and midwives, which focused on management of complications, birth spacing counseling and linkages to referral network.

Traditional birth attendants (TBAs), who deliver majority of babies in Cambodia, were trained to use the 'home birth kits' to reduce the risk of infection or death for both mother and newborn during home delivery. The training was intended to promote home birth kits and ensure their distribution for clean home deliveries. TBAs were also trained to act as reliable health educators on maternal and reproductive health issues. The training curriculum focused on danger signs during pregnancy, labor and postpartum. In addition, it addressed ANC, clean normal deliveries, basic hygiene, nutrition and PNC. The training also highlighted activities that were designed to strengthen the links between TBAs and government health professionals (Stoeckel 2000).

To maintain close contact between 'health center' staff and community leadership, feedback committees were created. Upon completion of training, committee members educated women about the danger signs of pregnancy and children's health at monthly meetings. They provided information to health center staff on health problems in their communities. Moreover, feedback committee members served as distributors of contraceptives for the purpose of expanding the supply of birth spacing commodities at the village level (Stoeckel 2000).

The program selected and trained volunteers for health promotion at the community. An innovative approach, which involved Pagoda nuns, village-based "*wat grannies*" and

monks to educate people about maternal and child health, was introduced. RACHA trained nuns worked as volunteers to disseminate information to mothers about treating diarrheal diseases using oral rehydration solution, birth spacing and proper breastfeeding techniques (Kannitha, Savery, and Titus 2002). These activities also created demand for reproductive and child health services among rural women (Stoeckel 2000).

The program worked closely with trainers to introduce integrated management of childhood illnesses (IMCI) concepts and provided training to the government health staff and other partners in managing sick children and vitamin A distribution. Another major activity conducted by the RACHA program to promote child survival included assisting the government to institutionalize the expanded program on immunization (EPI) and develop guidelines and service delivery strategies for neonatal tetanus elimination.

Innovative community-based incentives were introduced to keep service providers' interest to work and to increase access to maternal and child health services for the targeted populations. RACHA introduced community-based incentives to allow public service midwives to obtain sustainable personal benefit when they provided quality preventive and promotive MCH services. The program made marketable products available (e.g., delivery kits and birth spacing methods) through midwives. These products offered incentives for midwives and were expected to improve health service activities and to increase access to maternal and child health services. The program also introduced micro-credit system to establish strong relationships with villagers by responding to their critical need for credit and subsequently to gain villagers' support for basic reproductive and child health services.

As a part of the process to improve the health facility management and quality service delivery, RACHA provided technical assistance and introduced several tools. The logistics system was strengthened to improve the dispensing of drugs. In addition, the health information system was strengthened, and the MCH staff in the three provinces were given orientation to reorganize the health information system, to improve the completeness and quality of reported data, and to analyze and use the data.

Achievements

By developing and testing effective or innovative approaches in three provinces, the program helped the Ministry of Health and its multiple partners to improve the service delivery system (Stoeckel 2000). RACHA's safe motherhood program of training rural midwives in basic essential obstetric services has improved the standard of obstetric care at health centers and referral hospitals (Engender Health 2004). This training program became Cambodia's first midwifery training based specifically on the development of clinical competence in life saving skills rather than just the development of knowledge about these skills. The National Maternal and Child Health Center has adapted the curriculum used in the basic essential obstetric care and ANC training programs for their national level training programs (Stoeckel 2000). The effectiveness and sustainability of the program's basic essential obstetric care training has led other Cambodian NGOs to enroll midwives in their programs (Engender Health 2004).

It was observed that women changed their behavior and practices as a result of the health promotion activities conducted by RACHA (Kannitha, Savery, and Titus 2002). The increased number of women collecting iron tablets regularly from the health center, exclusively breast-feeding, making ANC visits, and receiving postnatal care and birth spacing services from the health center attests to the success of the health promotion activities (Stoeckel 2000).

Table 10 Summary of Reproductive and Child Health Alliance Program

Assessment category	Description
Strategy	Establish partnership with the Ministry of Health at multiple levels and build capacity of existing resources, whether private or public, both professional and traditional workers
Achievements	▪ Covering about 1.5 million people in rural areas (15 percent of total population) ▪ Helped Ministry of Health to improve the service delivery system ▪ Increased the availability of trained service providers in rural areas ▪ Introduced the safe motherhood training program at national level
Strengths	▪ Effective capacity building efforts - • trained midwives delivering both quality clinical services and health education to rural communities • trained TBAs making home births safer ▪ Trained health volunteers effectively implementing health promotion activities at the doorstep ▪ Linkages between health volunteers and functioning local health system for referral ▪ Involvement of religious leaders for health promotion ▪ Innovative incentive schemes ▪ Public private mix of services – successful partnership with Ministry of Health at multiple levels
Challenges	▪ Lack of trained human resources at the community level ▪ TBAs and midwives need to coordinate their work to promote quality services and to increase the number of deliveries by midwives ▪ Provide appropriate support, facilitation and follow-up for TBAs and the feedback committee members
Replication/scale up	Program integration with government services

Strengths

The effective capacity building and community-based activities/interventions have rendered the program a tremendous success. Success in partnering with the Ministry of Health has come from working at multiple levels, with elements of both the formal and informal systems and linking them wherever possible. RACHA increased midwives' capacity to deliver both quality clinical services and health education to rural communities (Engender Health 2004). Trained TBAs are now making home births safer (Stoeckel 2000). The use of local level religious leaders is an extremely innovative approach to health promotion, and holds great potential for national level replication. In addition, safe motherhood education through the use of feedback committees has contributed to the program success in health promotion. The feedback committee maximizes access to the supply of contraceptives to women. Trained feedback committee members also serve as a link between the health center and rural people. This allows the health center staff to intervene immediately, particularly in emergency cases (Stoeckel 2000). With the strengthened health information system, local MCH management can now provide analyzed data to NGO partners and use the data to assess which interventions contribute the most to program achievement.

Challenges or limitations

Increasing utilization of reproductive and child health services is constrained by several factors. The availability of trained staff to conduct health activities at the community level is severely limited (Stoeckel 2000). TBAs and midwives need to coordinate their work to promote quality services and to increase the number of deliveries by midwives. Appropriate follow-up is essential for TBAs since they coordinate with government staff on a voluntary basis and need regular support. For the feedback committees to continue their health promotion activities and to maintain their effectiveness, they need support and facilitation of their activities.

The Kean Svay Child Survival Project in Cambodia

The Kean Svay Child Survival Project started in October 1996 in Kean Svay district of Cambodia, expanded to another district in 2001 and finally completed in January 2004 (Shaw 2003). The project provided effective support to the three levels of the health system. It supported local health systems in delivering reproductive and child health interventions including immunization, case management of childhood illnesses, birth spacing and nutrition. The project aimed to build the capacity of local health centers. Additionally, the project activities were focused on health management systems, training of trainers, and planning, monitoring and evaluation. The project is considered to be a successful child survival initiative, which had an impact on more than 600,000 beneficiaries (World Vision Cambodia 2004).

The project adopted an effective community mobilization approach, which included: building the capacity of individual community members and establishing functional community-based structures to support them and create the link with the health center. At

the community level, the project created 'health center management committee', trained its members and established linkages between village health volunteers and this committee. In addition, 'village development committee' members from selected villages were trained in planning for development and implementing child health activities as well as the managerial skills (Debay 2003). To improve the quality of care, health center management committee's reports were used as guidance to solve the programmatic issues.

The project provided both basic and refresher training to 'health center' staff and village health volunteers. The project also trained TBAs, drug sellers and traditional healers. As a part of the training program, regular discussions were held between the government and project staff to select the training topics, trainers and trainees (Debay 2003). The management training was conducted to increase the managerial skills of the staff posted at district facility and health centers.

To supplement the existing health information system with morbidity and mortality data on children under five, the project introduced the 'community-based death and disease surveillance system'. The trained village health volunteers collected the required information (Debay 2003). The surveillance system enabled the project and local health services to monitor trends, set priorities and evaluate the effectiveness of child health and survival interventions in the project area.

As a process of strengthening health facilities, initiatives were taken to ensure availability of 24-hour services and regular outreach activities. To improve the health service delivery, the project provided a number of logistic supports. These include vehicles for project staff to expedite movement, bicycles for village health volunteers, and tri-motorcycle ambulances to transport patients from villages to health centers (Debay 2003). The project introduced cost recovery mechanisms to sustain village health volunteers and regular health center activities.

Achievements

The project has been successful in achieving its child health and survival objectives (Debay 2003). It strengthened community capacity to identify and respond to health needs. Equipping and training staff strengthened health system capacity as well. Moreover, the approach to build financial sustainability of the health center was effective.

Strengths

The success of the interventions is attributed to the strong support of the district, and the intense participation of the communities and the health center staff (Debay 2003). The project facilitated the partnership between district hospital, health centers and rural residents to work together to achieve a common goal. The surveillance system enabled the local health authorities to set priorities.

The training approach of the project was effective. The health center staff's technical knowledge and practices related to IMCI, EPI, nutrition, breastfeeding, birth spacing, and case management of childhood diseases increased. Training of the village health volunteers is the key service delivery component through which changes in behavior took place (Debay 2003). The other factor that contributed to positive health behavior change in the community was monthly meetings between the health center and the community including village health volunteers.

Table 11 Summary of Kean Svay Child Survival Project

Assessment category	Description
Strategy	Establish functional community-based structures and capacity building of local service delivery system to provide targeted services
Achievements	▪ Trained the service providers working at government facilities ▪ Established community-based structures to support the local level government health systems in delivering quality services ▪ Built community capacity to identify and respond to health needs ▪ Increased access to services provided at health centers
Strengths	▪ Active participation of community members in planning for development as well as implementing child health activities ▪ Improved technical knowledge and practices of the health center staff ▪ Trained village health volunteers ▪ Community-based surveillance system to set local health priorities ▪ Round the clock service at strengthened health center ▪ Collaboration between the health center and the community ▪ Cost recovery mechanism to sustain village health volunteers and regular health center activities
Challenges	To sustain the achievements of the project: ▪ Need to continue training of the new health center staff ▪ Support the activities of the health center management committee and village health volunteers ▪ Need to establish radio communication and introduce the provision of emergency transportation at the local level to refer patients
Replication/scale up	Yet to be replicated

Challenges and limitations

To sustain the achievements of the project, training the new health center staff, and supporting the activities of the health center management committee and village health volunteers need to be continued. There is a need to establish radio communication and provide ambulance at the health center level to refer patients to district hospitals or above.

Lady Health Workers program in Pakistan

In 1994, the Government of Pakistan introduced the 'lady health workers' program to provide health services to women and children living in rural and poor urban areas. A key program objective was to bridge the gap between service delivery from health facilities and the local community by creating a new cadre of female workers – commonly known as lady health workers (LHWs). The program is currently being implemented countrywide and has a strength of more than 85,000 workers (Karim and Saleem 2006). Each LHW is attached to a government health facility, from which they receive training and medical supplies. A single worker provides services to 1,000 individuals or approximately 200 households (OPM 2002a). As an important part of improving referral mechanism, the program has provisions to increase linkages between the community and first level care facilities through these workers. LHWs also coordinate with TBAs and local health facilities. The Federal Government is responsible for training, providing supplies and paying salaries of the workers and their supervisors.

The program recruits local, literate females as LHWs. These workers receive three months full-time basic training at the health facility where they are recruited, and twelve months task based (in-service) training, comprising a full-time week per month for twelve months at the health facility. The workers are trained to provide basic primary health care, family planning and MCH services and EPI vaccines. They are also trained to treat the most common conditions affecting the community. The second stage of training is designed to develop competence in the field. It includes three weeks of fieldwork, followed by one-week classroom problem solving session (OPM 2002b). LHWs attend monthly meetings at the health facility, which provide an opportunity to review the past month's work and plan for the next month (OPM 2002a). They collect information regarding basic health indices and utilization of services, which is aggregated at the national level and forms an important part of national health statistics. A supervision system has been built-in to reinforce the knowledge and skills of LHWs. On average, a supervisor is responsible for 27 workers. The supervisor has to visit each worker twice a month (OPM 2002b).

LHWs are provided with basic medical equipment including weighing scale, thermometer, torch and scissor, and a drug kit including essential medicines, contraceptive pills and condoms (OPM 2002b). The range of services that LHWs provide to their clients includes: hygiene education on drinking water and sanitation, nutritional advice and growth monitoring, advising women on maternal and child health, motivating and educating women on family planning and providing services, promoting and

facilitating vaccination and antenatal care. The workers treat minor ailments and refer more serious cases to first level care facilities. Services of these workers have also been utilized in other programs like tuberculosis detection and treatment and polio immunization campaigns.

Achievements

The program has been termed a success story and has achieved global recognition (Bhutta 2004). Over 30 million people across the country are receiving services from LHWs. In general, the services provided have created a positive impact on health outcomes amongst the poor and particularly women and children. LHWs are contributing directly to higher levels of contraceptive use, iron supplementation, antenatal care, growth monitoring and vaccinations among their clients. Services provided by these workers have also helped decrease childhood diarrhea rates (OPM 2002b). The most remarkable change has been the increase in contraceptive use rate from about 12 percent to 34 percent in ten years (Karim and Saleem 2006).

Strengths

The program provides basic health services to the community at the doorstep and has increased community acceptance of several culturally sensitive issues like family planning. In addition to providing primary health care and family planning services, LHWs are an important source of curative consultations (OPM 2002a). The hiring of local females contributed in the high level of acceptability and trust that LHWs enjoy in communities. The LHWs form an invaluable body of skilled human resource, whose services are often utilized for many other programs. They play an important role in identifying and referring serious illnesses, thus acting as a liaison between the formal health system and the local community.

Challenges and limitations

Though LHWs receive good quality training, they lack skills in certain issues. Improvements need to be made in the areas of communication and clinical skills (Afsar et al. 2003). It was observed that low salary and the contractual nature of the job created a constant threat and source of anxiety (Afsar and Younis 2005). Furthermore, LHWs are not regularly re-supplied with medicines and contraceptives. Also it has been found that referrals made by LHWs are not given priority at the health facilities, which in turn diminishes their credibility in the community.

LHWs maintain the record for all completed and on-going vaccinations in their areas. Thus, if the LHW's residence is declared a 'vaccination center', it will cut costs of the EPI and integrate the EPI service as a horizontal program (Afsar and Younis 2005). In addition, the potential of this program can be further utilized if existing health care delivery programs like malaria control and nutrition are incorporated in the services of the LHWs. The role of LHWs can also be expanded as skilled birth attendants.

Table 12 Summary of Lady Health Workers Program

Assessment category	Description
Strategy	Recruit and train female workers to bridge the gap between service delivery from health facilities and the community
Achievements	▪ Trained 85,000 females as LHWs ▪ More than 30 million people receive services from LHWs ▪ Made positive impact on health amongst the poor, particularly women and children ▪ Increased community acceptance of several culturally sensitive issues like family planning ▪ Contributed to the availability of health human resources in underserved areas
Strengths	▪ The hiring of local females ensures their acceptability in the target communities ▪ Doorstep delivery of primary health care and family planning services ▪ Curative consultations in communities ▪ LHW's capacity to identify and refer serious illnesses ▪ The services of LHWs often utilized for many other programs
Challenges	▪ Train LHWs as skilled birth attendants ▪ Provision of incentive – both skills development (e.g. communication and selected clinical skills) and financial benefits ▪ Regular supply of medicines and contraceptives ▪ Strengthen patient referral system
Replication/scale up	Government program

Community-based Health Planning and Services in Ghana

The Community-based Health Planning and Services (CHPS) initiative is a national program for reorienting and relocating primary health care and family planning services from sub-district health centers to convenient community locations. The CHPS service delivery model is based on the outcome of the national level policy initiatives to scale up the strategies and innovations from the experimental study of the Navrongo Health Research Center (Awoonor-Williams et al. 2004). The Navrongo experiment was launched in 1993 to address the longstanding problems associated with improving access to primary health care. It has provided the evidence that community mobilization combined with community-based deployment of the nurse represents the most effective innovative intervention to enhance service coverage (Awoonor-Williams et al. 2003).

Successful adaptation of the Navrongo service delivery model in Nkwanta district served as a vital intermediate step in the advancement of CHPS as a national policy. With this evidence, the Ghana Health Service is currently promoting the CHPS initiative as its primary strategy for realizing universal access to health care (Awoonor-Williams et al. 2004). Community health nurses, retrained and redeployed as community health officers at the newly constructed or renovated health compounds, are the central staff of the CHPS program. The program is responsible for supporting the nurse's training and for supplying essential equipment and start-up drugs. With modest financial support, communities build clinics and maintain health and family planning services. The community is obliged to maintain the facility, provide security, and support the nurse's daily living needs (Ghana Health Service 2002a). The development partner provided both the technical and financial support to the CHPS initiative.

Implementation of the CHPS program begins with the District Health Management Team program planning in one of the most impoverished communities of the concerned district. The process starts with identifying service area, assessment of manpower needs and capacities, and assessment of equipment and training requirements (Nyonator et al. 2002). Planning also involves a process of consensus building among the workers of a given CHPS implementation district (Ghana Health Service 2002b). When communities have been mapped and problems assessed, dialogues are organized in the community through public gatherings to introduce the activities (Awoonor-Williams et al. 2004). The process utilizes this traditional communication mechanism for conducting health education, mobilizing community support and assessing community reactions to services (Nyonator et al. 2002). Community leaders mobilize community volunteers for clinic construction. These facilities, referred to as community health compounds, become the residence as well as the service delivery points of the community health nurses (Awoonor-Williams et al. 2004).

The posting of nurses at the community level represents the most critical milestone in the CHPS process. These nurses, termed community health officers (CHOs), are community-based frontline health workers. Nurses entering the program receive an 18-month training at national training institutions and then intensively for six weeks in methods of community engagement, liaison, and outreach (Phillips, Bawah, and Binka 2005). Additionally, CHOs are trained in midwifery. These trained nurses provide outreach services in addition to convenient compound-based care during well-publicized hours of service delivery (Phillips, Bawah, and Binka 2005). Besides providing primary health care and prescribing selected drugs, they supervise safe delivery and are also responsible for organizing immunization and outreach days. These community health officers provide referrals to the clinics or hospitals for any services they are not able to provide (Pence et al. 2005).

To support the community health officers, a cadre of primarily male health volunteers are recruited and trained for six weeks followed by quarterly refresher training sessions (Awoonor-Williams et al. 2004). These trained volunteers are supplied with some basic medicines like paracetamol, multivitamins, chloroquine and aludrox. They, however, do not carry antibiotics or vaccines. Volunteers visit households to talk about hygiene, child

immunization, and other basic health issues, and to make the community aware that they are available for basic treatments and referrals (Pence et al. 2005). The volunteers also focus on mobilizing male participation in family planning promotion (Ghana Health Service 2002b).

Achievements

CHPS is a successful program implemented at the national level. Over a period of three years, 90 percent of the districts have started the planning process. CHPS model has become an integral part of government policy agenda to provide pro-poor health services. It is considered as an appropriate way to deliver health care to communities in undeveloped and deprived areas distant from health facilities. This initiative promotes equity of health outcomes by removing geographic barriers to health care and improves the utilization of resources (Ghana Health Service 2002a). Evidence suggests that assigning nurses to village locations reduced child mortality rates by over half in three years in the study areas. In addition, fertility was also reduced by 15 percent, representing a decline of one birth in the total fertility rate (Phillips, Bawah, and Binka 2006).

With CHPS now being implemented as national policy, the Ghana Health Service, the Navrongo Health Research Center and the Population Council began turning their attention to ways of transferring and adapting these evidence-based strategies to other countries in the region. In 2005, a partnership has been developed between Ghana, Burkina Faso and Sierra Leone. Country teams from Burkina Faso and Sierra Leone are working to develop pilot studies that adapt the CHPS processes to local contexts. In addition, Burkina Faso and Sierra Leone country teams will provide guidance to their Ghanaian counterparts, promoting ideas for improving CHPS implementation based on lessons learned in other countries (GHS, NHRC, and Population Council 2005).

Strengths

The program does not have a rigid implementation pattern, rather it takes into account local realities and necessities in the delivery of community-based health services. These health services are sustainable with available resources. The initiative improves the utilization of resources (Ghana Health Service 2002a).

Domiciliary services in addition to convenient compound-based services provided by nurses, involvement of traditional social institutions and village authorities in planning and delivering health services, and linkage of volunteer-based services with nurse's activities and clinical services have made the CHPS initiative a success. Community engagement provides the program with resources for facilities and gives the community a sense of ownership of the program. Practical means of utilizing traditional leadership and communication systems for health and family planning promotion have been developed and utilized. The CHPS process advances a system for community participation and leadership in managing and supporting health programs.

Challenges or limitations

Dearth of human and financial resources is a major constraint for nationwide implementation. Even if all available community nurses were trained and deployed, a serious shortage would still exist in many districts. Another important challenge is to build the capacity of community health officers to make independent clinical decisions or to offer effective midwifery services. The activities of the volunteers should be limited to health education, outreach coordination, and family planning provision.

Table 13 Summary of Community-based Health Planning and Services

Assessment category	Description
Strategy	Relocate primary health care and family planning from sub-district health centers to convenient community locations
Achievements	▪ CHPS evolved as an important component of government program and policy agenda to • deliver health care to communities • promote equity of health outcomes ▪ Contributes to the availability of health human resources in underserved areas ▪ Developed a system for community participation and leadership in managing and supporting health programs ▪ Developed practical means for health and family planning promotion
Strengths	▪ Nurses providing both domiciliary and compound-based services in the community ▪ Linkage of volunteer-based services with nurse's activities and clinical services ▪ Involvement of traditional social institutions and village authorities in planning and delivering health services where local realities and necessities are reflected ▪ Community participation for facility construction, service delivery, and program oversight
Challenges	▪ Human resource problems may hinder the nationwide implementation ▪ Need earmarked funding as start-up costs ▪ Ensure nurses' midwifery roles ▪ Make people aware of health volunteers' role
Replication/scale up	Implemented at the national level Replication in Burkina Faso and Sierra Leone

In the absence of earmarked donor or government funding, incremental start-up costs would severely constrain efforts to launch the program. Therefore, initial external investment in community health compound construction material and equipment is required.

Tanzania Essential Health Interventions Project

The Tanzania Essential Health Interventions Project (TEHIP), a joint initiative between Canada's International Development Research Center and Tanzania's Ministry of Health, has harnessed the efforts and resources of national and international collaborators. It started in 1996 to test the hypothesis that health care spending would have a greater impact if directed towards cost-effective interventions. The experiment was introduced in two districts, covering a total population of 741,000. TEHIP was designed and implemented with the intent to work within the existing health planning and management systems, rather than creating a parallel system. TEHIP developed several tools that enable the district health management team (DHMT) to set priorities and allocate resources as part of their planning processes. The "tool box" includes:

- Burden of Disease Profiles to identify health needs at the community level;
- District Health Accounts to map district health budgets and expenditures in relation to the burden of disease and other criteria;
- District Health Service Mapping tool to allow health administrators to access a quick visual representation of the availability of specific health services or the attendance at health facilities for various interventions across the district; and
- Community Voice tools to promote community participation and inform health planning, and promote ownership.

Using the management and planning tools, the DHMTs improve planning, revise proportional allotment of funds, and promote integrated solutions that offer multiple benefits from health interventions. Overall, they increase the efficiency of district health systems by trying to ensure that funds are allocated more proportionally to key interventions for the major local causes of death and disability.

The DHMT identified the missing skills, particularly local deficits in management, administrative, and other skills. Several supportive interventions were introduced with the aim of improving the quality of health care. These interventions are: additional funding at district level, strengthening district health management and administration, delegation of activities to 'health center' level, and community ownership of health facilities.

In order to test innovations in the planning process the project introduced additional funds (up to US $2 per capita) into the district health budget. These funds allowed districts to achieve new efficiencies in the daily operations of health systems and to increase spending where needed on interventions aimed at the most significant contributors to the local burden of disease (Savigny et al. 2004).

There was a lack of appropriate capacity for planning, management, and administration among District Councils to implement necessary health service delivery improvement activities. In its aim to address this issue, the project adopted a strategy that incorporated two specific tools. Health planning teams were trained in understanding and using these tools. The first of these two tools was designed to enhance problem solving and analytical skills, team building, and delegation skills. This tool was also expected to increase the confidence and skills of health management personnel. The second tool was a ready-to-use, user-friendly, guided summary of the National District Health Planning Guidelines (Savigny et al. 2002).

To improve the quality of health services in districts by creating a "functional hierarchy" below the district, an innovative management system (termed 'management cascade system') was introduced. The intention was to organize and integrate health service delivery at the district level more efficiently and economically. This new strategy was aimed at devolving authority and responsibility to lower levels within the health system. It also intended to promote the links between community health workers and supervisory personnel. Several activities were undertaken to improve the communication and the effectiveness of supervisors, and to increase the efficiency of routine functions. For example, the radio call system and appropriate transportation including motorcycles and bicycles were introduced to improve the referrals (Savigny et al. 2004).

To make community participation effective, the project adopted two main strategies. One centered on mobilizing and stimulating communities to renovate run-down health care facilities. The other sought to implement the "community voice" tool to help people identify local health needs and set priorities. These priorities would then be fed into the district planning process, with community and district working together to determine plans of action.

Community inputs for rehabilitation of health facilities were used as an entry point to engage the community members into planning, implementing, monitoring and evaluating the process (Savigny et al. 2002). The community prepared work plans and contributed labor and materials in carrying out the rehabilitation and maintenance of health facilities. The rehabilitation of health facilities was a development intervention that was selected in order to help foster ownership and self-confidence in community members, while developing skills of the district authorities and local leaders on community labor oriented approaches to rehabilitation and maintenance (Neilson and Smutylo 2004).

Achievements

TEHIP influenced formulation and content of national health policies, and content and delivery of district health services in two project districts. It shows that how health systems benefit when local communities and officials contribute to key decisions and participate in efforts to improve health services. It improved the functioning of the health system. Child mortality in the project areas fell by over 40 percent in the five years following the introduction of evidence-based planning (IDRC 2005). The TEHIP experience demonstrated the value of IMCI and insecticide-treated net interventions in

terms of lowering morbidity and mortality rates as well as being cost-effective (Neilson and Smutylo 2004).

The experience of the project is being scaled up nationally. The management tools, supportive interventions, and innovative practices are being made available to continue to extend and improve the effectiveness of district health systems (Savigny et al. 2004). The concept of providing additional funds to the district health "basket" is now being implemented at the national level (Neilson and Smutylo 2004). The new management system devolved authority and responsibility to lower levels within the health system and improved the service delivery (Savigny et al. 2004).

Table 14 Summary of Tanzania Essential Health Interventions Project

Assessment category	**Description**
Strategy	Develop and deliver locally prioritized cost-effective health services
Achievements	▪ Influenced formulation and content of national health policies, and service delivery ▪ Developed and refined several tools to help DHMT to select the most pressing health problems and to improve service delivery ▪ Additional fund enabled district health planners to implement the selected health services and interventions effectively and efficiently ▪ Devolved authority and responsibility to lower levels within the health system
Strengths	▪ Health activities developed in concert with local cultural conditions and local needs ▪ Effective management, planning and priority-setting tools ▪ Additional fund to the district health budget ▪ New management system for improved management and delivery of quality services ▪ Community participation in planning and managing health facilities and services
Challenges	▪ Lack of capacity to replicate ▪ Cost of expansion ▪ Need to invest in human resources ▪ Need to ensure quality health facility infrastructure, equipment, information and communication technologies
Replication/scale up	Government program Under process for national level scale up

Strengths

The development of management tools and strategies proved to be invaluable aids for the district health teams to improve health services in their areas. The experience demonstrated that a combination of practical management, planning and priority-setting tools that assist an evidence-based approach can strengthen health systems. Capacity building of the district health management staff especially in implementing services and interventions has improved the health system service delivery. Used in conjunction with the burden of disease and resource allocation tools, the additional fund enabled district health planners to implement the selected health services and interventions effectively and efficiently. Thus, health care spending can be translated into an increase in health gains.

The introduction of a new management system was effective in increasing the communications and feedback between the different groups of health care workers and the management at the district level. It improved the distribution of drugs in the villages, particularly at the dispensaries, reduced problems that had existed in the distribution of staff pay, and improved the referral of emergencies (Savigny et al. 2004).

Community participation was central to the TEHIP approach, where communities took ownership and responsibility for their own health facilities and services. The voice of the community in the planning process had translated into changes in the health service delivery systems.

Challenges or limitations

The cost of expansion, the lack of capacity to replicate, the technical support required to implement the tools in the scale up districts, and the lack of coordination among various players working in the health sector are seen as constraining factors inhibiting TEHIP's influence, or future potential. Delivery of scaled-up health services ultimately depends on well-supported primary health care providers. It is observed that many dispensaries and clinics are in ruins. There is a need to ensure quality health facility infrastructure and equipment, and information and communication technologies.

The Skilled Care Initiative in Tanzania

In 2001, a five-year innovative project was launched in Igunga, a rural district in Tanzania, with an aim to improve maternal health by increasing the use of skilled care by all women before, during, and after childbirth. This rural district has a population of approximately 325,000 and is served by a network of 34 health facilities (2 hospitals, 5 health centers, and 27 dispensaries). However, less than half of all pregnant women (44 percent) deliver with a skilled attendant in a health facility. Over five years, the project aimed to increase the rate of skilled care during childbirth by at least 10 percent in the target district (Family Care International 2005a). The project worked with district officials, service providers, and community leaders to implement a range of activities to improve the quality and availability of maternity services.

The project provided intensive training in life-saving obstetric skills to a total of 115 maternity care providers. Training was also provided in interpersonal communication and counseling, with an emphasis on compassionate treatment of clients and on counseling women and their families about making preparations for childbirth. In addition, staff from hospitals and health centers in the project district were trained to manage complications of abortion.

A major focus of the project activities was to upgrade the health infrastructure and strengthen maternal health service delivery at rural health centers and dispensaries. Rehabilitation of facilities took place in order to provide 24-hour services. The project made substantial investments in obstetric care equipment, and the facilities had all the equipment necessary to provide routine maternity care and manage obstetric emergencies. In addition, the project supported the district's transition from a "drug kit system" (in which standard drug packages with preset contents are delivered according to the level of each facility) to a demand-based system, in which facility managers requested drugs and supplies based on their caseload and needs (Family Care International 2005b).

To strengthen referral between hospital, health centers and dispensaries, the project introduced the provision of radio call systems and telephones. The radio call system was intended to allow providers at remote facilities to contact the district hospital to get necessary advice on complicated cases. The project supplied an ambulance with a mobile call receiver for the district hospital to ensure emergency transportation for referrals.

The project introduced a range of interventions to strengthen health service management at health facilities and in the district hospital. Attempts were made to build expertise or strengthen the skills of the district health management team in supportive supervision, health budgeting and planning. To enhance record keeping at health facilities and at the district level, the project staff in collaboration with the Ministry of Health introduced an improved delivery register to obtain data on referrals and the partograph to monitor labor. A broad-based behavior change campaign was launched to encourage the use of skilled care during pregnancy, delivery and the postpartum period, with a special focus on raising awareness and promoting responsiveness to obstetric complications (Family Care International 2005a).

The impact of the interventions will be known after the post-intervention survey which will measure changes in women's use of skilled care during pregnancy, delivery and the postpartum period (Family Care International 2005a).

Strengths

The project made strategic investments to address basic problems with the health system service delivery. Along with the training of service providers, a range of activities were undertaken to strengthen the overall health system and to create an enabling environment for ensuring improved performance of skilled providers. The introduction of the radio call system strengthened referrals between the facility and the community and provided timely response to the service providers at the local level in managing complicated cases.

Challenges and limitations

To sustain the achievements of the project, special emphasis should be placed on building the capacity of local partners and on ensuring that they have the skills to maintain new systems that have been established, repair donated equipment, and cover recurring costs with funds from the district health budget. At the national level, skilled care should be prioritized in national health policies and strategies, and there is a need to advance supportive norms and guidelines for the provision of skilled care as well. Effective partnerships between development agencies, government ministries, and local communities are also required.

Table 15 Summary of Skilled Care Initiative

Assessment category	Description
Strategy	Build capacity of service providers and local level health facilities to provide skilled care at the community
Achievements	▪ A total of 115 maternity care providers received intensive training in life-saving obstetric skills ▪ Upgraded the health infrastructure and renovated facilities where needed ▪ Strengthened referral systems through the introduction of the provision of communications and emergency transportation ▪ Improved supplies, management and services in health centers
Strengths	▪ Health service delivery strengthening efforts to ensure skilled care both routine maternity care and obstetric emergencies care: • provider training • necessary supplies and equipment • strengthening linkages for referral ▪ Radio call system with counseling on managing or stabilizing complicated cases and emergency transportation ▪ Introduction of a demand-based logistics system, in which facility managers request drugs and supplies based on their caseload and needs ▪ A broad-based behavior change campaign to educate and mobilize communities to increase use of skilled attendants ▪ Public-private partnership
Challenges	To sustain the achievements of the project: ▪ Build the capacity of local partners to maintain new systems that have been established ▪ Prioritize skilled care in national health policies and strategies
Replication/scale up	A pilot study - yet to have evaluation

IV. LESSONS LEARNED FROM SELECTED SERVICE DELIVERY MODELS

With the aim to reduce maternal, neonatal and child mortality, the following innovative service delivery models have been implemented in Bangladesh, Cambodia, Pakistan, Ghana, and Tanzania:

- Community Health Volunteers program in Bangladesh
- Maternal and Child Welfare Center project in Bangladesh
- Reproductive and Child Health Alliance program in Cambodia
- Kean Svay Child Survival Project in Cambodia
- Lady Health Workers program in Pakistan
- Community-based Health Planning and Services program in Ghana
- Tanzania Essential Health Interventions Project, and
- Skilled Care Initiative in Tanzania.

The community health volunteer model in Bangladesh demonstrates that appropriately selected and trained community members can deliver basic health services at the doorstep. Being provided with logistic support, and linked to a functioning referral system, the community health volunteers provide targeted services effectively at the doorstep. In the same way, the strategy to recruit and train female workers to bridge the gap between service delivery from health facilities and the community also worked in Pakistan.

The Maternal and Child Welfare Center strengthening project in Bangladesh demonstrates a sustainable approach to ensure skilled professional at the facilities that provide comprehensive EmOC and to provide effective referral services. Experiences from this project indicate that training of the service providers working at the facility, and upgrading physical infrastructure, appropriate equipment and supplies, referral and necessary transportation are key service delivery improvements through which these facilities can effectively provide safe motherhood services including comprehensive EmOC.

It has emerged from Cambodia's RACHA program that establishing successful partnership with the Ministry of Health at multiple levels and using existing resources, whether private or public, both professional and traditional workers, improve the availability of MCH services in rural areas. The key to success of this public-private partnership is the effective capacity building and community-based activities.

Cambodia's Kean Svay Child Survival Project demonstrated considerable achievements towards child health and survival. The experience of this project is yet to be replicated. The project strengthened community capacity to identify and respond to health needs, as well as strengthened health care service delivery and trained service providers working at government facilities. The project facilitated the partnership between the health center and the local people to achieve a common goal and established functional community-based structures to support local health systems in delivering services.

The CHPS initiative characterizes the key strategy for changing primary health care including family planning services from a focus on clinical care at district and sub-district levels to a new focus on convenient and quality services at the community level. Domiciliary services in addition to convenient clinic-based services provided by nurses, community involvement in planning and delivering health services, and linkage of volunteers with nurse's activities and clinical services have made the CHPS initiative a success.

Tanzania's experience substantiated the need for developing and delivering locally prioritized cost-effective health services. It is observed that the TEHIP approach has improved the functioning of Tanzania's health system by using the planning tools and the additional fund. The management, planning and priority-setting tools help identify interventions reflecting the local needs. Equally important, the additional funding to 'district health plans' contributes to both the process impacts and to the ultimate health outcomes. TEHIP provides the evidence that how health systems benefit when local communities and officials contribute to key decisions and participate in efforts to improve health services.

With the objective to provide skilled maternal care at the community level in Tanzania, the Skilled Care Initiative built the capacity of service providers and local level health facilities. To ensure skilled care in both routine maternity care and obstetric emergency care, activities undertaken to strengthen health service delivery included necessary equipment and supplies, strengthening linkages for referral, and communication and transportation.

Key interventions of successful service delivery models

Implementation experiences reveal that the Community Health Volunteers program and the Maternal and Child Welfare Center strengthening project in Bangladesh, Pakistan's Lady Health Workers program, the Reproductive and Child Health Alliance program in Cambodia, the Community-based Health Planning and Services program in Ghana, and the Tanzania Essential Health Interventions Project can be characterized as successful service delivery models.

These service delivery models or initiatives are community focused and they are either incorporated in the government program or implemented in collaboration with the public sector. The key strengths of these programs are: skilled human resources, strengthened health service delivery system, involvement of the community in planning and implementing health services, public-private partnership, and selecting females as the health care providers. Efforts have been made in the following section to identify the key interventions of the successful service delivery models and to consolidate lessons learned from these interventions.

Capacity building of service providers

Service providers make important contributions and are an essential component of the service delivery. Evidences suggest that the availability of trained service providers at the community level increases the access to maternal and child health services for the rural people. The knowledge and skill of the service providers have been found to be the key strength of any program. The 'community health volunteer' strategy implemented by BRAC is considered as a successful response to the shortage of health human resources in rural Bangladesh. The MCWC project shows that training of the service providers has enabled the existing facility to effectively provide comprehensive EmOC service.

LHWs form an invaluable body of skilled human resources to provide family planning and primary health care services including MCH services to the underserved populations in Pakistan. These trained workers have proved their effectiveness in providing doorstep services, identifying and referring serious illnesses, and participating in other health programs of the government. However, lack of interpersonal communication and social mobilization skills was identified as barriers to the implementation of effective communication strategies for improved MCH services in Pakistan. These skills are necessary for the LHWs to maximize individual behavior change.

In Cambodia, RACHA's safe motherhood program of training rural midwives in basic essential obstetric care has achieved national recognition of obstetric practice at local level health centers. The program increased midwives' capacity to deliver both quality clinical services and health education to rural communities to meet the needs of pregnant women. Besides, TBAs trained at village level are making home births safer by using 'home birth kits'. It is clear that trained health volunteers effectively implement health promotion activities at the doorstep and serve as a link between the health center and rural people, but their interpersonal communication skills need to be strengthened.

In Ghana, community health nurses, retrained and redeployed as community health officers, provide outreach services in addition to convenient clinic-based care. Findings demonstrate that relocating trained nurses from the sub-district level facility to the village level clinic with doorstep service delivery responsibilities reduced child mortality. However, human resource problems on availability and skills hinder the nationwide implementation of the activities.

Along with service providers, the management and support workers, though not engaged in the direct provision of services, can make important contributions to improving the service delivery at the local level. For example, Tanzania Essential Health Interventions Project shows that capacity building of the district health management staff especially in implementing interventions and managing services has improved the service delivery system. The project is being implemented countrywide. The implementation experience, however, demonstrates the need for well-supported primary care providers and emphasizes the necessity to invest in human resources.

A public-private partnership project in Tanzania, termed as Skilled Care Initiative, suggests that improving the knowledge and skills of service providers to deliver quality care for both normal and complicated pregnancies is a major component of maternal health care services.

Community level interventions

Community level interventions involve two major activities: (a) motivating and training community members to provide health education and basic primary health services including MCH services, and (b) involving traditional village authority in planning, developing and managing service delivery. Community health services can be provided at the fixed facility, and at the doorstep as well.

Evidence shows that the service providers and health workers' presence in their community has enabled them to earn the trust and acceptability to implement different interventions on maternal, newborn and child health. BRAC's experience suggests that being a female member of the community where she works, selected by the own community, and responsible to the community have made the CHVs deliver targeted services effectively to both mother and child in rural areas in Bangladesh. The hiring of local females has contributed to the high level of acceptability and trust that LHWs enjoy in communities in Pakistan. LHWs usually play the expected 'first contact' role and act as a liaison between community and formal health system.

Using community resources for capacity building has made RACHA a sustainable program in Cambodia. The use of religious leaders or volunteers for health promotion is an effective approach, which increases demand for health services and changes behavior among the rural people. Trained feedback committees bridge the gap between the local people and the health center. The presence of feedback committees within the village increases access to contraceptives. Moreover, feedback committees effectively conduct health promotion activities.

In Ghana, local realities and necessities are reflected in planning and developing health services. In addition, CHPS initiative engages community people or resources in local health care activities. A range of community-based strategies have made the initiative a success. These strategies are: launching fixed facility services in the community, dual responsibilities of community health officer, involvement of traditional social institutions and village authorities in planning and delivering health services, and recruitment and training of volunteers and linking them with community health officer's activities. The experience also suggests that traditional gatherings are now used throughout Ghana to build community consensus and involvement in health care services. Overall, involving the community provides the program with a sense of ownership.

Tanzania Essential Health Interventions Project engaged the community in identifying and prioritizing local health needs, and in developing and managing local health facilities and services. Community planning and monitoring was an important part of the success of the TEHIP. Communities took ownership and responsibility for their own health

facilities and services. The community participation involved setting out detailed work plans and contributing labor and materials in the rehabilitation and maintenance of the health facilities.

Community focused health service delivery programs have been successful in ensuring access to local people. Outreach enables the system to achieve the program objectives. The CHVs and LHWs go to patients' homes rather than see them in a 'chamber' or clinic. RACHA program in Cambodia provides effective health education services at the doorstep in rural areas. The Ghana model suggests that relocating primary health care and family planning from sub-district health center to convenient community clinic proved effective in enhancing service coverage. These programs work effectively because people do not have to visit a health facility to receive the service as health workers make contacts with villagers on a regular basis.

When it comes to the issue of funding community level interventions, the evidence shows that the Pakistan government has set a precedence to support a large program (LHW) by means of its own revenues. The government provides full support including training, supplies and salaries of the LHWs and their supervisors. Both Ghana's CHPS and Tanzania's TEHIP initiatives are national programs, which were initially supported by external funding. Ghana's CHPS model demonstrates that initial external investment in community health clinic construction and equipment is required to expedite implementation of community-based care. With additional money to district health budget TEHIP has improved the functioning of Tanzania's health system. The concept of providing additional funds to the district level is now being implemented countrywide. However, sustainable financing remains a major issue for the expansion of the TEHIP approach. The absence of earmarked donor or government funding may severely constrain efforts to implement these programs nationally.

Community level interventions suggest that some form of incentive needs to be provided to community volunteers to work in rural areas. In Bangladesh, BRAC introduced several innovative ideas to sustain community health volunteers' interest in health work. These include opportunities to earn an income by selling essential drugs and other health products, and access to collateral-free loans. Similarly, the RACHA program introduced an innovative initiative for midwives to earn additional income through the sale of health products (e.g., delivery kits and birth spacing methods) when they provide MCH services. However, in keeping workers or volunteers motivated in their work, national policies and guidelines have been found to be an impediment in Cambodia. Government policy and outreach guidelines do not support payments of any kind to health volunteers. It may be necessary to re-examine incentive policies and review motivation strategies.

Strengthening health care service delivery

Evidences suggest that capacity building activities are coupled with a range of complementary interventions to strengthen the overall health service delivery system and to create an enabling environment that supports skilled providers or trained community

health workers. Activities to improve health care service delivery center on infrastructure, equipment and supplies, information and transportation, and referral.

If strengthened, the existing infrastructure can provide comprehensive emergency obstetric services. In rural Bangladesh, MCWCs have been upgraded with the provision of 24-hour comprehensive EmOC services. The provision of ambulance ensures timely referral of complicated patients. The linkages with higher and lower level health care facilities have made safe motherhood services possible for complicated deliveries. These initiatives improved the health service delivery, and increased the access to EmOC. With these upgraded centers, many rural women have avoided deaths and disabilities. These upgraded centers have become a sustainable unit for providing EmOC services.

Similarly, Tanzania's Skilled Care Initiative ensured that facilities had all the equipment needed to provide routine maternity care and manage obstetric emergencies. The referral system was improved with the introduction of the radio call system. This radio call system allowed providers at remote facilities to contact the district hospital to request emergency transport or to get advice on managing or stabilizing complicated cases.

TEHIP emphasized quality health facility infrastructure and equipment to provide essential packages of health services in rural areas in Tanzania. If clinics at the community level are refurbished, vehicles provided for transportation of providers and supplies, and appropriate information and communication technologies adopted, access to the essential services for local people can be ensured.

In Ghana, facility-based services in the community have been launched. These facilities function as both the residence as well as the service delivery points of the community health officers/nurses. With the strengthened logistics system and effective referral, quality services have been ensured at the community level. Outreach services and compound-based care provided by the community health officer, and coordination of volunteers' services with community health officer's activities and clinical services have established a systematic linkage for health care at the rural community. Volunteers refer clients to the community health officer, who in turn provides referrals to the clinics or hospitals for services she is not able to provide. As a result, an increased number of women and children are receiving services from trained nurses posted at the community.

The child survival project in Cambodia was effective in improving management and services in health centers, and this resulted in an increased use of facility-based services. Among the main improvements are the availability of services on a 24-hour basis, regular outreach activities, appropriate transportation for conducting outreach activities, and increased cost recovery of the health center. The project, however, advocates the need to establish radio communication and provide ambulances at the local level health centers to refer patients to district hospitals.

Although LHW services have strengthened the service delivery system by bridging the gap between the community and the government health facilities, the health systems of Pakistan have not been supportive towards the LHW program. Referrals made by LHWs

are not given priority at the health facilities. In Cambodia, TBAs and midwives should coordinate to promote service quality and to increase the number of deliveries by midwives.

Involvement of non-profit or development sector

Governments in developing countries are turning to the private and non-profit sectors as potential partners to expand the access, coverage and sustainability of health services. NGOs, development partners and other stakeholders participate with the government to expedite the process of maximizing efficiency in health sector.

As a result of continued commitment, innovativeness and financial support provided by the sponsoring organization, CHV strategy has become a sustainable model for the provision of comprehensive primary health care services in rural areas in Bangladesh. Through the CHV strategy BRAC has expanded the vision of NGO involvement from mere supplementary or complementary agents for the government to respected partners in the health service delivery at the community level.

The MCWC project in Bangladesh demonstrates successful collaboration between government and development partner in upgrading the facility to deliver comprehensive EmOC services. The Government of Bangladesh, with financial and technical support from a development partner, undertook appropriate strategies to expand the services provided at the MCWC, and to make comprehensive EmOC services available at the facility and increase its utilization.

In Cambodia, RACHA program provides a successful example for utilizing both private and public resources in delivering health services in the rural area. The program has succeeded in partnering with the Ministry of Health, at multiple levels, with elements of both the formal and informal systems and linking them wherever possible. The program works extensively with voluntary and commercial sectors, and utilizes existing resources, both professional and traditional workers.

The development and implementation of Community-based Health Planning and Services is a donor-supported public sector initiative in Ghana. The development partner provided both the technical and financial support. The initiative has become the operational model for relocating health service from sub-district facility to community level. This health care development model is replicated at the national level. Similarly, TEHIP is another example of successful collaboration between government and development partner, which has contributed to improving the efficiency and accessibility of health services. At present, the TEHIP approach has been included in the national program, and the evidence-based approach using burden of disease and cost-effectiveness measurements as tools for setting priorities and allocating health resources has been institutionalized.

V. CONCLUSION

Health systems in many developing countries cannot provide adequate and quality maternal and child health services. Many developing countries, especially those in Africa, are faced with an acute shortage of appropriately trained human resources for health. Added to this is the unavailability of trained service providers at the community level. Health facilities are found to be generally ill equipped to provide skilled care, and absence of proper referral mechanisms from community to local level health facilities or to hospitals is also a significant barrier to advanced life saving care.

Clearly, strengthening health service delivery systems with skilled and motivated health workers is central to improving maternal and child health. A wide range of service delivery models or interventions have been implemented in health systems in Bangladesh, Cambodia, Pakistan, Ghana and Tanzania with the aim to reduce maternal, infant and child mortality. In some countries, the interventions have been found to be more successful than in others, while other countries demonstrate mixed results. For example, in Ghana the government is currently promoting the CHPS approach as its primary strategy for realizing universal access to health care. TEHIP's management, planning and priority setting tools, and the management cascade system are being adapted across the country in Tanzania.

The major strength of the service delivery models is their community-based health care approach. Implementation of these models demonstrates some significant achievements fundamental to reducing maternal and child mortality and morbidity. They are: capacity building which includes training of service providers and recruiting and training community health workers/volunteers; strengthening health service delivery systems, including upgrading facilities, developing evidence-based local level planning and strengthening linkages for referral; involving the community in developing and implementing health services; and public-private partnership.

Community health workers/volunteers have been used as a strategy to bridge the human resource gap in health program implementation in developing countries with different settings. Being a member of the community, especially a female one, and being chosen by and responsible to the community where she works, have made community health workers effective in their delivery of targeted services to both mother and child. Evidence suggests that such workers not only provide basic health services including maternal and child health to communities often unreached or ignored by formal health systems but also promote equity in the access to health services and ensure community involvement. Lessons learned from successful community health worker or volunteer strategies could provide an alternative model to countries where recruitment, training and retention of health workers have been managed with difficulties. Additionally, to meet the growing needs of the local people, community health workers' services can be utilized for other health services. Their role can be expanded as skilled birth attendants. Such a strategy could facilitate the attainment of health goals including the MDGs in many countries.

The presence of skilled maternity care throughout pregnancy, childbirth and the postpartum period is considered an effective strategy for reducing maternal mortality. The skilled human resource care approach needs to include both routine services and emergency care and has to ensure appropriate maternal health services at local level facilities. With trained female health workers who can ensure normal delivery at home, availability of doctors, nurses and anesthetists is an important link in the needed support chain to ensure effective referral for providing delivery complications services. Similarly, trained health workers can facilitate newborn care within the household and community with functional referral system.

The necessity for strengthening health facilities is accentuated in many developing countries. The existing infrastructure needs to be strengthened for the provision of quality services, especially provision of basic and comprehensive emergency obstetric care, and neonatal care services. As long as essential emergency care services remain absent or inaccessible, neither rural midwives nor TBAs will be able to achieve significant improvements of care in critical obstetric situations at the community level. Evidence demonstrates that with the strengthened health facilities particularly the availability of comprehensive essential obstetric care procedure, maternal deaths, severe disability and stillbirths are avoided. While it comes to improving the child health, there is a need to improve management and services in local level health centers with the goal to increase utilization of services from the facility. Equally important is the regular outreach activities in conjunction with the appropriate logistics and technologies to enable the local level health centers to refer complicated cases to higher level facilities. It is likely that the quality of services provided by the upgraded facilities will help improve the maternal and child health situation in the country and achieve the MDGs.

It is evident that implementation of community-based health services takes into account local realities and necessities. Community planning and monitoring is an important component of these services. Success of community-based health services depends on local leadership. Community leaders can effectively mobilize social support for prioritizing needs and constructing or rehabilitating health facilities in their locality, and for managing the local health service delivery system. Community participation expedites the construction or renovation of facilities to be used as service delivery points for community-based health care. To complement the convenient facility-based services provided by skilled human resources, outreach services by community health workers or volunteers and the linkage of volunteers with facility-based services are also necessary to improve maternal and child health service coverage in rural and remote areas. In addition, community level interventions should take measures to sustain health volunteers' interest in health work. Incentives like opportunities to earn an income by selling essential drugs and other health products, and access to collateral-free loans to enable other income earning activities can be introduced for community volunteers.

Systemic improvement of health care delivery can play an important role in reducing mortality and morbidity in developing countries. Local level health systems should have the ability to allocate health resources in strategic ways that target real and prevailing needs. In this connection, the evidence-based planning and management strategies enable

the local level facility staff to improve health services. Practical and affordable health system planning tools are required to improve health services in resource poor countries. It is observed that health care spending, in combination with the appropriate strategies, can be translated into an increase in health gains. Therefore, funding and implementation priorities must be based upon local level, evidence-based plans that aim to improve the health system, maximize health, and reduce inequities. Moreover, integration of vertical services – safe motherhood and immunization services – at all levels may provide additional potential for the delivery of a range of maternal and child health interventions both at health facilities and doorstep.

Evidence strongly points to the need for establishing and maintaining linkages with higher and lower level health care facilities. In addition, referral hospitals should be supportive of community health workers. It is to be noted that community health workers through their services increase linkages between the community and the first level care facilities. Besides, linkages between volunteers, traditional birth attendants and midwives are required to promote service quality and to increase the number of births delivered by midwives or provide referrals to clinics or hospitals for any complicated services. It is also necessary for local level health facilities to have communication and transportation facilities for effective and timely referral.

There are successful evidences of public and private sector collaboration in implementing service delivery interventions. The major concern lies with the funding. Earmarked donor or government funding needs to be continued when to implement successful pilot interventions nationally. The existing facilities may be upgraded when and if necessary. It is equally important that newly recruited and trained community health workers or volunteers provide health education and encourage the pregnant mothers and caretakers of children to avail of delivery and healthcare services at the existing facilities, either government or NGO. Along with the government's commitment, NGOs have a role in improving the service delivery by providing resources and technical assistance.

The maternal and child health services need to be decentralized to the lowest level of the health system that can safely provide these services, thereby reaching those women and children who are least able to access hospital care including the poor, uneducated, and/or those living in remote, rural settings. Community-based initiatives can extend the targeted maternal and child health services in areas where health services are hard to access. Health care service delivery strengthening and capacity building have been proved to be the essential and integral part of community-based service delivery models. When the successful experimental models are to be implemented at the national level, the cost of expansion, the capacity to replicate, the technical support required to implement the strategies at national level, and the coordination among various players working in the health sector should be considered in detail.

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